Vol. 23, Part 1 Nos. 1–59

HELMINTHOLOGICAL ABSTRACTS

incorporating

BIBLIOGRAPHY OF HELMINTHOLOGY

COMPILED FROM WORLD LITERATURE OF 1954

Prepared by the

COMMONWEALTH BUREAU OF AGRICULTURAL PARASITOLOGY
(HELMINTHOLOGY)

Published by the

COMMONWEALTH AGRICULTURAL BUREAUX, FARNHAM ROYAL, BUCKS., ENGLAND

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Vol. 23, Part 1
1954

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FOR THE YEAR 1954

Vol. 23, Part 1

1—Agricultural Gazette of New South Wales.

a. ANON., 1954.—" New plant diseases." **65** (2), 102–103.

(1a) The occurrence of *Heterodera marioni* in New South Wales in *Brachychiton populneum* (at Tamworth), *Protea oblongifolia* (in the metropolitan area) and in *Callistephus hortensis* (at Coff's Harbour) is recorded for the first time. R.T.L.

2—Agriculture. London.

a. HORTON-SMITH, C., 1954.—" Parasitology of deep litter." **60** (12), 569–571.
b. SPEDDING, C. R. W., 1954.—" Pasture management to control worms in sheep." **61** (2), 51–54.

(2a) Although a high concentration of ammonia inhibits the development of *Ascaridia* and *Heterakis* ova after four days' exposure under laboratory conditions, this concentration is probably never attained in the deep litter house owing to the constant movement of the litter by the poultry. It cannot be assumed that the risk of infection of poultry by parasites is completely absent in properly functioning litter. R.T.L.

(2b) As the well-being of sheep is affected even by low level, subclinical infestation with helminths, complete control must depend on pasture management to prevent reinfestation. As three days intervene between the passage of helminth ova in faeces and their development to the infective stage, reinfestation can be prevented by strip grazing or hurdling sheep and moving them to fresh ground every two days. Details are given of the successful application of this method in preventing reinfection and thus stabilizing existing infections with a view to their eventual elimination. R.T.L.

3—American Journal of Hygiene.

a. VON BRAND, T., WEINSTEIN, P. P. & WRIGHT, W. H., 1954.—" The working ability of rats infected with *Trichinella spiralis*." **59** (1), 26–31.
b. ZAIMAN, H., WILSON, J. D., RUBEL, J. & STONEY, J. M., 1954.—" Studies on the nature of immunity to *Trichinella spiralis* in parabiotic rats. IV. The immune response in 'uninfected' parabiotic rats surgically separated from their mates 2, 3, 4, or 5 days after the latter received an immunizing infection." **59** (1), 39–51.
c. ZAIMAN, H. & STONEY, J. M., 1954.—" Studies on the nature of immunity to *Trichinella spiralis* in parabiotic rats. V. The strength of the immune response in the 'uninfected' twin one month after its mate received an immunizing infection of *Trichinella* at the rate of 15 larvae per gram of body weight." **59** (1), 52–59.

(3a) The working ability of five series of rats infected with various stages of *Trichinella spiralis* and five series of controls was studied by means of a running apparatus. The criteria by which the working ability was measured were the length of time for which the rats were able to run and the loss in weight during this period. Two series of rats harboured mature larvae; in these the running times (in hours) were $2{\cdot}06 \pm 0{\cdot}43$ and $1{\cdot}95 \pm 0{\cdot}39$ compared with $4{\cdot}21 \pm 0{\cdot}5$ and $3{\cdot}25 \pm 0{\cdot}55$ in the controls, and the weight losses (per 100 gm. per one hour)

* Titles so marked throughout this number have not been seen in the original.

were 2·6±0·35 and 2·9±0·34 compared with 1·5±0·19 and 1·9±0·28. One series harboure larvae which had just encapsulated; in these the running time was 1·19±0·43 compared wit 5·81±1·18 and the weight loss was 3·7±1·3 compared with 1·3±0·18. Two series wer infected with migrating larvae and in these the running times were 4·56±0·38 and 1·24±0·3 compared with more than 7·14 and 4·97±0·59, and the weight losses were 1·6±0·16 an 5·0±0·56 compared with 1·0±0·06 and 1·6±0·21. These results together with the numbe of larvae recovered are tabulated and the experiments described in detail. The authors con clude that there may be some justification for claims of reduced working ability in person affected with chronic trichinelliasis. S.W

(3b) Continuing their earlier work on immunity to *Trichinella spiralis* in parabioti rats [for abstracts see Helm. Abs., **22**, Nos. 70a, 70b, 70c] Zaiman and his co-workers hav carried out three experiments on more than 100 pairs and equivalent controls. Statistica analysis of the results failed to confirm that "uninfected" twin rats became more resistan than the controls when separated surgically from the "infected" twin two, three or four day after the immunizing dose of larvae. There was, however, partial confirmation that a highe resistance was shown by "uninfected" twins separated five days after the immunizing dos and the numbers of worms recovered from the diaphragms of rats separated at four days wer consistently lower than those from the controls. The authors are of the opinion that conclusiv results could only be obtained by using a very large number of pairs or a more nearly optima dosage of larvae, or both. S.W

(3c) Zaiman & Stoney report further experiments on the immunity of parabiotic rat to *Trichinella spiralis* [see also the preceding abstract]. The results indicate that "infected" members of pairs became highly resistant to reinfection when the immunizing dose wa 15 larvae per gm. body-weight; the strength of the immune respose in the "uninfected" twi was considerable and protected most of them from the lethal effects of a large challengin infection at the rate of 75 larvae per gm. body-weight. This killed all but one of the pairs o control animals. S.W

4—American Journal of Tropical Medicine and Hygiene.

a. CHANDLER, A. C., 1954.—" A comparison of helminthic and protozoan infections in tw Egyptian villages two years after the installation of sanitary improvements in one of them. **3** (1), 59–73.
b. CHERNIN, E., 1954.—" Problems in tropical public health among workers at a jute mill nea Calcutta. II. A study of intestinal parasites in the labor force." **3** (1), 94–106.
c. CHERNIN, E., 1954.—" Problems in tropical public health among workers at a jute mill nea Calcutta. III. Intestinal parasites in the European supervisory staff and their foodhandle servants." **3** (1), 107–111.
d. WEINSTEIN, P. P., KRAWCZYK, H. J. & PEERS, J. H., 1954.—" Sparganosis in Korea. **3** (1), 112–129.
e. WILKS, N. E. & SONNENBERG, B., 1954.—" Intestinal parasites in food handlers returne from Korea." **3** (1), 131–135.
f. PAN, C., WILLIAMS, R. R. & RITCHIE, L. S., 1954.—" The penetration-time for th cercariae of *Schistosoma japonicum*." **3** (1), 136–138.
g. PALMER, E. D. & JAHNKE, Jr., E. J., 1954.—" Observations on portal hypertension amon schistosomiasis patients with relatively insignificant complaints." **3** (1), 139–146.
h. BOND, H. W. & NOLAN, M. O., 1954.—" Results of laboratory screening tests of chemica compounds for molluscicidal activity. II. Compounds of mercury." **3** (1), 187–190.
i. GREVAL, S. D. S., 1954.—[Correspondence.] **3** (1), 197.
j. SODEMAN, W. A., 1954.—" Our future?" [Presidential Address.] **3** (2), 203–208.
k. MELENEY, H. E., 1954.—" Problems in the control of schistosomiasis." **3** (2), 209–218.
l. JONES, F. E., SMITH, C. S. & EYLES, D. E., 1954.—" Epidemiological study of *Endamoeb histolytica* and other intestinal parasites in the New Hope community of Tennessee. A restud after 21 years." **3** (2), 266–275.
m. NOR EL DIN, G. & EL BAZ, I., 1954.—"Sputum examination in the diagnosis of bilharz iasis of the lungs." **3** (2), 326–328.
n. KARTMAN, L., 1954.—" Suggestions concerning an index of experimental filaria infection i mosquitoes." **3** (2), 329–337.

o. CHERNIN, E., 1954.—" Problems in tropical public health among workers at a jute mill near Calcutta. IV. Hemoglobin values and their relation to the intensity of hookworm infections in the labor force." **3** (2), 338–347.

p. CHERNIN, E., 1954.—" Problems in tropical public health among workers at a jute mill near Calcutta. V. Eosinophile levels and their relation to intestinal helminthiasis in the labor force." **3** (2), 348–355.

q. MILLER, A., 1954.—" Dung beetles (Coleoptera, Scarabaeidae) and other insects in relation to human feces in a hookworm area of southern Georgia." **3** (2), 372–389.

(4a) Between 1948 and 1951 the International Health Division of the Rockefeller Foundation installed certain sanitary improvements and health services in a group of Egyptian villages. After these had been in operation for about two years, Chandler made a study of their effectiveness. Incidence of helminth infections in 144 individuals in one of these villages (Sindbis) was compared with their incidence in 140 individuals in Aghour El Kubra where no sanitary changes had been made. At Sindbis, the majority of the houses had latrines and an unpolluted water supply had been installed. Examination of the faeces of 144 individuals at Sindbis showed that the incidence of Ascaris was 50% with an average of 4,200 ova per gm. At Aghour El Kubra the Ascaris incidence was 76% with an average of 6,900 ova per gm. Evidence was obtained that the dirt floors of the houses were more important than uncooked vegetables as a source of Ascaris infection and that the degree of infection of members of a household was correlated with the amount of contamination of the floors. The incidence of hookworm in Sindbis was 7% in females and 12% in males and in Aghour El Kubra it was 17% in females and 42% in males, but infections were light. Trichostrongylus infection was light but very common: in Sindbis it was 29% and in Aghour El Kubra 40%, reflecting probably a close association with animals in the houses. *Hymenolepis nana* occurred in Sindbis in 25 persons and in Aghour El Kubra in 11. The lower incidence in the latter village is held to corroborate Chandler's opinion that this infection is most commonly acquired from food contaminated with rodent faeces. R.T.L.

(4b) A survey of intestinal parasites among 750 mill workers at the Ludlow Jute Co. near Calcutta showed that 76·1% had helminth infections, viz., hookworm 68·7%, *Trichuris trichiura* 16·4%, *Ascaris lumbricoides* 9·6%, *Strongyloides stercoralis* 8·1%. The incidence of ascariasis and trichuriasis in Muslims was 29·9% and 46·7% and in Hindus 3% and 6·5%. As no differences in prevalence were noted between workers living in sanitated quarters within the mill compound and those living in the unsanitated nearby villages, it is concluded that focal sanitation cannot be effective in an unconfined and uneducated population living in an environment in which sanitation is of a low order or is non-existent. R.T.L.

(4c) As a corollary to the survey of 750 workers at the Ludlow Jute Co. [see No. 4b above], a similar study was made of the intestinal parasitism of the European supervisory staff and their families, and their food-handling servants. Of the 62 persons in the supervisory grade only one had a helminth infection, viz., *Trichuris trichiura*. The infections among the 47 servants were: hookworm 49%, Ascaris 17%, Trichuris 17%, Enterobius 6%, Strongyloides 4% and *Hymenolepis nana* 2%. Ascaris and Trichuris were far more common among the Muslims than among the Hindus. R.T.L.

(4d) Three cases of sparganosis in North Korean prisoners of war are reported. All the patients had eaten raw snake caught within or in the vicinity of the prison compounds. Many plerocercoids were found in a snake, *Dinodon rufozonatum*, caught in a rice paddy in the vicinity of the prison. In Korea, the eating of raw snake is considered to be of nutritional and medicinal value and is a fairly common practice. R.T.L.

(4e) Multiple stool examinations of 287 U.S. Army food-handlers returning from Korea showed the following helminth infections: Ascaris 8·4%, hookworm 4·9%, Trichuris 13·9% *Hymenolepis nana* 0·3%, Strongyloides larvae 1·7%. The infections were light and there were no clinical manifestations. R.T.L.

(4f) The time required for the penetration of cercariae of *Schistosoma japonicum* into mice and hamsters was based on the recovery rate of adult schistosomes. Infection occurred in mice after exposure for periods as short as ten seconds. In hamsters the shortest successful exposure was 30 seconds. When exposure was continued for three minutes, 52% of the mice and 97·7% of the hamsters became infected. This period represents the near maximum infections. The animals were wiped dry immediately after exposure. R.T.L.

(4h) Screening tests of 32 mercury compounds on *Australorbis glabratus* were made in a dilution of 10 parts per million for a period of 24 hours, followed by a recovery period of 24 hours (or longer if necessary) in fresh water with food provided. All the chemicals were effective at 10 p.p.m. Tests at dilutions of 5, 3, 1, 0·5, 0·3 and 0·1 p.p.m. were then made. The detailed results are tabulated. There was no correlation between the mercury content and the activity of the compounds. Based on the results at 0·3 p.p.m., the most effective were *iso*propylmercuric thiocyanate and phenylmercuric acetate each of which gave 90% kill, and *n*-propylmercuric thiocyanate and phenylmercuric nitrate each of which gave 60% kill. In the laboratory these four chemicals are more efficient than pentachlorophenol. The concentrations necessary to effect a rapid kill are so low that these compounds can probably be used with safety in waters used by man. R.T.L.

(4i) Greval recalls that in 1922 to 1923 he recorded in the *Indian J. Med. Res.* the occurrence of *Schistosoma haematobium* and *S. mansoni* in the same part of Arabia as that recently surveyed by the U.S. Naval Medical Research Unit No. 3 Cairo, and mentions that eight years afterwards he found a heavy concentration of schistosome eggs in tissues received from Aden for confirmation of a diagnosis of cancer. R.T.L.

(4j) In this presidential address to the American Society of Tropical Medicine and Hygiene, Sodeman stresses the view that tropical medicine will become a science in its own right only after the collection of facts leads to the establishment of basic laws of health and disease based on the concept that there is a great reservoir of disease in animals other than man, and calls for co-ordinated efforts on the total problem of the disease, on the organism, the host and the environment. Insight into the total problem may be lost by too great specialization in research. As an illustration of the lack of correlation of information between the haematologist and the parasitologist and the inadequacy of specialization, Sodeman cites a recent case of hookworm disease and severe anaemia. From the stool examination it was estimated that there were about 6,000 hookworms. A first treatment caused the evacuation of 2,000 and a second and third gave sufficient to account for the original estimate. It has been estimated that a hookworm can remove about 0·67 c.c. or more of blood per day but the total volume of blood in the average person is about 4,000–5,000 c.c.; on this basis almost all the blood in the body of this patient would have been removed by the worms in a single day. Older worms, however, remove possibly not more than 0·1 c.c. per worm daily; on this basis the patient would lose 600 c.c. per day or the amount of a usual blood donation. R.T.L.

(4k) Meleney reviews the problems of schistosomiasis control under the headings (i) chemotherapy, (ii) excreta disposal, (iii) protection against infection and (iv) eradication of the intermediate host. There are few endemic areas where one method alone can effect control. General education in hygiene and specific education concerning this infection combined with international efforts should lead progressively towards its ultimate conquest. R.T.L.

(4l) Compared with a previous study by Milam & Meleney in 1931 of intestinal parasitism in 357 individuals in the white New Hope community of Jackson County, Tennessee, helminthic infections in 322 individuals were definitely lower. *Ascaris lumbricoides* infections had decreased from 32·8% to 9·6%, *Necator americanus* from 5·9% to 1·9%, *Trichuris trichiura* from 10·6% to 0·9% and *Hymenolepis nana* from 1·4% to 0·6%. Better facilities for faecal disposal now exist and there is a greater consciousness of the importance of avoiding faecal contamination. A comparison with the results of a recent survey made by the authors of a rural

negro population in west Tennessee shows that the percentage of infections was higher in the white New Hope community in spite of its much superior general sanitation and cleanliness. R.T.L.

(4m) Schistosome eggs were present in the sputum of 22 out of 62 patients suffering from schistosomiasis. In 20 the eggs were those of *Schistosoma haematobium* and in two those of *S. mansoni*. The radiological examinations of the chests were characteristic of lung schistosomiasis. Some early cases showed mitralization of the heart and late cases gave a typical "cor pulmonale" picture. R.T.L.

(4n) Kartman suggests a formula for expressing host efficiency of a given species of mosquito for a filarial parasite; this is the ratio of the mean number of third-stage larvae per mosquito surviving at the end of the filarial incubation period to the mean number of microfilariae per mosquito in samples shortly after feeding on an infected definitive host. He suggests two additional components, (i) the survival rate of the mosquito host, i.e. the percentage of engorged females which survive the parasite's extrinsic incubation period and (ii) the infection rate of the host which is obtained by dividing the number of mosquitoes harbouring third-stage larvae at the end of the parasite's incubation period by the number of mosquitoes surviving at the end of the incubation period. The following index reflects the effects of these three components: Index of experimental infection = survival rate × infection rate × efficiency rate. This index is applied by Kartman to determine the susceptibility of various mosquito species to infections with *Dirofilaria immitis*. R.T.L.

(4o) From a study of the haemoglobin values in workers in a jute mill in west Bengal it is concluded that hookworm infections are not at present a serious health problem in the males. The female workers were more heavily parasitized and did not appear able to compensate for blood loss when the intensity of infection resulted in over 400 ova per gm. of faeces. R.T.L.

(4p) From an investigation on eosinophilia in relation to intestinal helminthiasis in a jute mill in west Bengal, it appears that eosinophil levels in individual workers could not be taken to indicate the presence or absence of helminth infection. In 179 workers free from helminths the eosinophilia averaged 8·7%. In 571 workers infected with helminths it was 10·8% and appeared to be more closely connected with hookworm than with other helminth infections. Other possible causes of the increased eosinophils are discussed, e.g. filarial infection, visceral larva migrans, mites in the respiratory tract and tropical pulmonary eosinophilia. R.T.L.

(4q) In south-eastern Georgia, human excrement is seldom seen owing to the activity of dung beetles. Some species remove the faeces, others bury it at a site of deposition. Detailed data are given which suggest that the survival of the eggs and larvae of parasitic worms in buried faeces and their transportation to a distance may have an indirect bearing on the degree of pollution and worm infestation of soil by keeping defaecation sites in an acceptable condition for continued use. R.T.L.

5—American Journal of Veterinary Research.

a. HABERMANN, R. T., WILLIAMS, F. P. & THORP, W. T. S., 1954.—" Common infections and disease conditions observed in wild Norway rats kept under simulated natural conditions." **15** (54), 152–156.

(5a) The helminth infections present in 100 wild *Rattus norvegicus* caught on Parsons Island in Chesapeake Bay were: *Heterakis spumosa* 56%, *Strongyloides ratti* 16%, *Syphacia obvelata* 2%, *Trichuris muris* 2%, *Capillaria hepatica* 49%, *Trichosomoides crassicauda* 6% and *Cysticercus fasciolaris* 3%. In two rats there were small thread-like worms in the mucosa and in the lumen of the ureter. These probably were larval forms of *T. crassicauda* which had migrated from the bladder. R.T.L.

6—American Midland Naturalist.

a. VAN DER WOUDE, A., 1954.—" Germ cell cycle of *Megalodiscus temperatus* (Stafford, 1905) Harwood, 1932 (Paramphistomidae: Trematoda)." **51** (1), 172–202.
b. CHANDLER, A. C., 1954.—" A new nematode, *Chlamydoprocta itascensis* n.gen., n.sp. (Spiruridae) from a skunk, *Mephitis mephitis*, in Minnesota." **51** (1), 313–315.

(6a) Van der Woude describes the fixing and staining techniques used in her study of the germ cell cycle of *Megalodiscus temperatus*. She gives a detailed account of gametogenesis which is similar to that described in other digenetic trematodes. Two polar bodies are formed during maturation of the ovum and the diploid chromosome number is eighteen. Fusion of the pronuclei and development of the miracidium takes place while the eggs are in the uterus. The first cleavage is unequal and results in a large ectodermal and a small propagatory cell; only the ectodermal cell continues to divide until about the eight to ten-cell stage when the propagatory cell divides into a large and a small cell both of which continue to divide but in a different way. By the time the miracidium is developed the propagatory cell has given rise to ectodermal cells, which form the soma of the first generation redia, and germinal cells which remain in the posterior end of the redia and will in turn give rise to second, third and possibly more generations of rediae. The cercariae develop from germinal cells in a similar fashion and it is only in the cercariae that the germinal cells multiply to form the genital primordium which develops into ovaries, testes and the accessory reproductive structures. There is no indication of the formation of gonads or any sign of maturation in the earlier generations. S.W

(6b) *Chlamydoprocta itascensis* n.g., n.sp., a spirurid found in the stomach of *Mephitis mephitis* in Minnesota, is briefly described and figured [but is not differentiated from other spirurids]. Although it was firmly attached to the mucosa Chandler thinks it possible that the skunk is not the usual host. R.T.L

7—Annales de Parasitologie Humaine et Comparée.

a. BRAVO HOLLIS, M., 1954.—" *Diplectanum amplidiscatum* n.sp., trématode monogénetique des branchies d'un poisson marin." **29** (1/2), 37–41.
b. CHABAUD, A. G., 1954.—" Sur le cycle évolutif des spirurides et de nématodes ayant une biologie comparable. Valeur systématique des caractères biologiques." **29** (1/2), 42–88.
c. PÉREZ FONTANA, V., 1954.—" Recherche des oeufs d'helminthes en vue de l'étude épidémiologique du kyste hydatique." **29** (1/2), 163–166.

(7a) *Diplectanum amplidiscatum* n.sp. from the gills of the marine fish, *Paralabrax maculofasciatus*, on the Mexican coast of the Pacific Ocean, differs from other species of the genus in the structure of the single ovum, the position of the cirrus and of the uterus and the presence of two glandular pouches opening on the disc at the posterior end of the body. R.T.L

(7b) Chabaud has studied the morphology and life-cycles of a number of spirurids, filariid and a subulurid and describes and illustrates adults and larvae. He has attempted to confirm the work of Chitwood & Wehr [for abstract see Helm. Abs., **3**, No. 432a] on the classification of the Spiruroidea which they based chiefly on the morphology of the head. He has also investigated the possible systematic value of certain biological characters including larval morphology (especially the cephalic cordons in the Acuariinae, and the female genital apparatus and lateral pseudo-labia), the type of life-cycle, the type of intermediate host and the rate of metamorphosis, speed of development and localization within the intermediate hosts. During his work he obtained a number of new forms and here gives descriptions and drawings of them. They are *Physocephalus theodoridesi* n.sp. of which encapsulated larvae were collected from *Trox perlatus*, *Ascarops joliveti* n.sp. of which free and encapsulated larvae were found in *Hegeter tristis*, and *Spirura rytipleurites seurati* n.var. of which larvae were found in *Pimelia rugosa*. In the last named there is apparently no fourth-stage larva, the adult developing directly from third-stage larvae. *Arduenna kutassi* Schulz, 1927 is transferred to *Streptopharagus* as a new combination. The work is to be continued. S.W

(7c) Pérez Fontana describes a technique for examining faecal samples for helminth ova, particularly those of *Echinococcus granulosus*. After sedimentation a few drops of sediment are put on filter paper which is lightly dried over a spirit lamp and then rendered transparent with xylol, benzene, turpentine etc. The paper can then be examined under a microscope. The sediment can be fixed and stained before being put on to the filter paper by using a mixture of 500 gm. 10% formalin, 50 gm. 5% Lugol's solution and 5 gm. acetic acid. S.W.

8—Annals of Tropical Medicine and Parasitology.

a. ELMES, B. G. T. & McADAM, I. W. J., 1954.—" Helminthic abscess, a surgical complication of oesophagostomes and hookworms." **48** (1), 1–7.
b. MACLEAN, G. & HAY, U., 1954.—" An experiment in the control of schistosomiasis. First report." **48** (1), 21–27.
c. KERSHAW, W. E., CREWE, W. & BEESLEY, W. N., 1954.—" Studies on the intake of microfilariae by their insect vectors, their survival, and their effect on the survival of their vectors. II.—The intake of the microfilariae of *Loa loa* and *Acanthocheilonema perstans* by *Chrysops* spp." **48** (1), 102–109.
d. KERSHAW, W. E. & NICHOLAS, W. L., 1954.—" Studies on the epidemiology of filariasis in West Africa, with special reference to the British Cameroons and the Niger delta. V.—The intensity of infections with *Loa loa* and with *Acanthocheilonema perstans* in the rain-forest, the forest fringe and the mountain grasslands of the British Cameroons, and its relation to the incidence." **48** (1), 110–120.

(8a) Elmes & McAdam describe in detail three cases of helminthic abscess. Surgical intervention revealed species of *Oesophagostomum* in two and *Ancylostoma* in one. In two further cases with similar histology no living worms were found and in five other cases in which inflammatory masses were found in the caecal wall no biopsy was done. The authors propose the name "helminthoma" for this condition. S.W.

(8b) Likoma is a small, densely populated island in Lake Nyasa. Maclean & Hay, in their first report on their experiment on the control of schistosomiasis haematobia there describe the surveys of the population and of the snails which they carried out and the treatment of infected cases. Of 3,468 persons examined 957 were infected and were treated with nilodin; of these 801 were followed up and re-examined, 45 remaining positive. Copper sulphate was used to poison the intermediaries in pools and rice fields and on the part of the lake shore which was frequented by the inhabitants. By these means and by educating the people in the cause and prevention of the disease the authors hope to break the chain of infection. S.W.

(8c) Kershaw *et al.* consider that as *Chrysops* can only feed from a pool of blood and not directly from a capillary, this may account for the fact that in their experiments the intake of *Loa loa* microfilariae from an infected person was widely variable but normally lower than was expected. The intake of microfilariae of *Acanthocheilonema perstans* approximated to the expected value. The difference in intake of the two microfilariae may be explained by the smaller size and greater activity of those of *A. perstans*. S.W.

(8d) Working in four rain-forest villages and four villages lying across the abrupt forest fringe, Kershaw & Nicholas compare the incidence and intensity of infections with *Loa loa* and *Acanthocheilonema perstans*. In the rain-forest the incidence of *L. loa* is nil at birth, rising to 40% in old age. Until maturity the intensity is similar in pattern but there is no significant increase with age in adults. In the forest fringe villages the incidence falls sharply but the intensity shows the same irregularity as in the rain-forest. The incidence of *A. perstans* in the rain-forest reaches 100% in childhood or early adolescence and the intensity increases with age. In the forest fringe the incidence decreases, although not as sharply as that of *L. loa*, but the intensity changes very markedly, few microfilariae being found in people of all ages. The possible suppressive factors affecting the two infections, their mode of action and the differences between the two host-parasite relationships are discussed. S.W.

9—Arkiv för Zoologi.

a. WIESER, W., 1954.—" On the morphology of the head in the family Leptosomatidae (marine freeliving nematodes). With a key to all genera described." Ser. 2, **6** (1), 69–74.

(9a) The armature of the head in leptosomatids is made up of two different components, a cephalic capsule and a stomodaeal capsule. In the latter a pharyngeal capsule and a buccal capsule can be distinguished. Wieser does not accept Filipjev's view that the cephalic capsule, like the stomodaeal capsule, is a differentiation of the pharynx and not of the cuticle. A key to 19 leptosomatid genera is provided. R.T.L.

10—Australian Journal of Agricultural Research.

a. RIEK, R. F., 1954.—" Studies on allergic dermatitis (Queensland itch) of the horse: the aetiology of the disease." **5** (1), 109–129.
b. SOMMERVILLE, R. I., 1954.—" The histotropic phase of the nematode parasite, *Ostertagia circumcincta*." **5** (1), 130–140.

(10a) This disease has been considered to be identical with a dermatitis of horses reported from India, the Philippine Islands and the U.S.A., of which the skin-infesting microfilariae of *Onchocerca reticulata* are claimed to be the cause. Microfilariae could not be incriminated in the cases in Australia. An examination of 282 horses revealed *O. reticulata* in 225 (80%) but only 57 (25%) of these showed dermatitis. Of 57 horses in which no worms were found 22 (39%) had lesions of the disease. Detailed examination of skin samples showed that microfilariae may be widely distributed throughout the skin, including the ears and tail. The greatest numbers were in the skin of the withers. There was no correlation between the number of larvae recovered and the presence or absence of lesions of the disease. In most of the sections of macroscopically healthy skin, the presence of microfilariae was not associated with any cellular abnormalities. The disease is apparently an allergic dermatitis caused by the bites of a sand-fly *Culicoides robertsi*. H.McL.G.

(10b) Larvae of *Ostertagia circumcincta* entered the gastric pits and glands and passed the third ecdysis three days after administration to sheep. Some of the larvae failed to grow after ecdysis and were found in the mucosa as long as three months later, some migrated into the lumen of the abomasum immediately after ecdysis and others developed in the mucosa, migrating to the lumen either when adult or during the fourth stage. Most larvae were found in the mucosa in the pyloric region and around the cardiac orifice. A few were found in the fundus where they formed large, flattened nodules. In these nodules the peptic, parietal and mucous chief cells were replaced by foveolar cells. It is suggested that larvae in the histotropic phase are unlikely to be affected by anthelmintics. The role of these larvae in the epidemiology of ostertagia disease has not been determined. H.McL.G.

11—Australian Veterinary Journal.

a. BAIN, A. M., 1954.—" Diseases of foals." **30** (1), 9–21. [Discussion pp. 24–25.]
b. WILTSHIRE, F. H., 1954.—" Diseases of foals." **30** (1), 22–24. [Discussion pp. 24–25.]
c. RIEK, R. F., 1954.—" The influence of sodium salts on the closure of the oesophageal groove in calves." **30** (2), 29–37.
d. GORDON, H. McL., 1954.—"The anthelmintic efficiency of phenothiazine against immature *Trichostrongylus colubriformis*." **30** (2), 38–40.

(11a) Helminths are clinically the cause of more unthriftiness and greater losses than any of the other pathological conditions to which foals are liable. The most lethal and pathogenic are the species of *Strongylus*. It is difficult to determine when unthriftiness due to a low level of nutrition predates, and is only aggravated by, parasitic infection. Very severe parasitism may be characterized clinically by oedema of the limbs and lower abdomen with debility and anaemia or by profuse diarrhoea, debility, weakness and prostration. The larger strongyles affect foals at an early age through the development of aneurysms which start forming in the first six weeks of life, but are dangerous only when the blood supply to parts of the bowel is occluded by thrombus formation. It is recommended that all mares be dosed before coming

on to the stud; all foals should be treated, irrespective of age, at intervals of three months. Control measures should include pasture rotation with transfer, after dosing, to paddocks which have been rested for three months. R.T.L.

(11b) Wiltshire considers that ascariasis in foals is a debilitating infection and can recall at least one death annually from intestinal obstruction and one or two instances with earlier symptoms of lung damage with a slight cough. He quotes three instances of prenatal infection in which adult ascaris were removed by carbon disulphide when the foals were four weeks old. The best means of controlling strongylosis is by picking up the droppings, by rotational grazing with other species of domestic animals, by harrowing the paddocks and by avoiding overstocking the pastures. Despite such precautions, strongyle aneurysms may still occur. R.T.L.

(11c) Although copper sulphate closes the oesophageal groove in sheep it is of little value in cattle. Of 13 other chemicals tested for this purpose 60 ml. of a 10% solution of sodium bicarbonate was the most effective. R.T.L.

(11d) Gordon confirms, by a new series of experiments on sheep, that the usual dose of 15 gm. of phenothiazine has little if any effect on *Trichostrongylus colubriformis* when 12 days old, whereas 40 gm. kill 70% to 75% of the worms at this age. When repeated doses at 20-day to 35-day intervals were given to sheep which were receiving daily doses of larvae, the worm burden was apparently reduced temporarily and the development of fatal trichostrongylosis was delayed. He concludes that in outbreaks of trichostrongylosis larger doses than those ordinarily given are necessary in order to remove immature worms. R.T.L.

12—Berliner und Münchener Tierärztliche Wochenschrift.

a. HOLZ, J., 1954.—" Experimentelle Untersuchungen über die Möglichkeit der Übertragung von *Trypanosoma equiperdum* durch Blutegel." **67** (10), 158. [English summary p. 158.]

13—British Medical Journal.

a. VAUGHN, J., 1954.—" Eosinophils in the sputum." Year 1954, **1** (4852), 27–28.
b. ROGERS, K. B., 1954.—" Examination of faeces for infection and infestation." Year 1954, **1** (4854), 147–149.
c. GORDONOFF, T., 1954.—" Piperazine in the treatment of threadworms." [Correspondence.] Year 1954, **1** (4858), 394.
d. OKOJIE, X. G., 1954.—" Symptoms of dracunculiasis." [Correspondence.] Year 1954, **1** (4858), 397.
e. WHITE, R. H. R. & STANDEN, O. D., 1954.—" Piperazine in the treatment of threadworms." [Correspondence.] Year 1954, **1** (4859), 460.
f. MAC KEITH, R., 1954.—" Piperazine in the treatment of threadworms." [Correspondence.] Year 1954, **1** (4860), 521.
g. HARTLEY, F., 1954.—" Piperazine in the treatment of threadworms." [Correspondence.] Year 1954, **1** (4860), 521.
h. RIBEIRO, A. L., 1954.—" Symptoms of dracunculiasis." [Correspondence.] Year 1954, **1** (4865), 819.
i. McFADZEAN, J. A. & HAWKING, F., 1954.—" Arsenamide treatment of filariasis due to *W. bancrofti* and *A. perstans*." Year 1954, **1** (4868), 956–959.
j. SEMPLE, A. B., MEREDITH DAVIES, J. B., KERSHAW, W. E. & ST. HILL, C. A., 1954.—" An outbreak of trichinosis in Liverpool in 1953." Year 1954, **1** (4869), 1002–1006.
k. ANON., 1954.—" Trichinosis." [Editorial.] Year 1954, **1** (4869), 1025–1026.
l. WOODRUFF, A. W., 1954.—" Tropical diseases in Britain." Year 1954, **1** (4869), 1030–1033.
m. COTTERELL, G. M., 1954.—" Treatment of threadworm infestation." [Correspondence.] Year 1954, **1** (4870), 1099.

(13a) Simultaneous examination of the blood and sputum of 205 natives of Sukumaland in Tanganyika, where the incidence of parasitic infection is high, tends to support the view that eosinophils appear in the sputum as a late stage in the course of an eosinophilia and that "the demonstration of eosinophils in sputum indicates that an eosinophilia is or has recently been in progress". R.T.L.

(13c) Gordonoff questions the harmlessness of piperazine, a recently recommende treatment for *Enterobius vermicularis*. Given by mouth to rats at the rate of 4 gm to 5 gm. pe kg. body-weight, it proved toxic and in some instances lethal. It is therefore advised that th drug be given only under direct medical supervision and not to out-patients. R.T.

(13d) The clinical symptoms of fever, vomiting and urticaria described as usual in dracon tiasis by Ribeiro [for abstract see Helm. Abs., 22, No. 322c] are, in Okojie's experience i Nigeria, exceptional and occur only when the patient scratches the irritated area and endeavou to pull out the worm prematurely. Usually there is a dull ache succeeded by intense itchin and the formation of a blister. R.T.

(13e) White & Standen, replying to Gordonoff's criticism [see No. 13c above], poin out that the dose of piperazine which he found toxic to rats is more than 60 times the maximu dose recommended by them for the treatment of threadworm and few side effects have bee reported. R.T.

(13f) Mac Keith, referring to the correspondence of Gordonoff and White & Stande on the subject of the alleged toxicity of piperazine when used as a remedy for threadworm [see Nos. 13c, 13e above], states that he has used double the recommended dose without i effects and points out that aspirin, one of the safest drugs, might be fatal in excessive dose R.T.

(13g) Hartley states that the sparingly soluble piperazine adipate does not exhibit th toxic properties shown by the parent base and its soluble salts, and does not result in acute c chronic toxicity when given to mice, rats, dogs or other animals even in doses up to 7 gm per kg. body-weight. When administered as tablets, doses not exceeding 1·8 gm. daily eradica threadworms in children and adults in two days. Piperazine adipate is also effective again roundworms and hookworms. R.T.

(13i) Thirty-two cases of *Wuchereria bancrofti* infection received 125 mg. of arsenamic daily by intravenous injection, usually for 10 to 12 doses. Most of the microfilariae disappeare from the blood within two weeks after the first dose and 30 of the patients were free fro microfilariae six months later. There was also a significant reduction in the number of micr filariae of *Acanthocheilonema perstans*. In some patients there were indications of toxic actio on the liver. This is regarded as a contra-indication except in special cases. Other min effects were vomiting, dizziness, headache and loss of weight. In a few cases, there we localized inflammation or allergic reactions apparently around killed adult worms. R.T.

(13j) In Liverpool, 82 cases of trichinelliasis occurred in late October and early Novemb 1953. The present report deals with the epidemiological and clinical features of the outbrea 62 of the cases were women. The source of infection in 34 cases was raw sausage and in 33 cas cooked sausage. Five had handled but not eaten any pork product except bacon, five ha eaten cooked sliced ham from the firm handling the infected sausage meat, two had eaten po from other sources and three gave unreliable histories. Two of these cases were traced pork roasted at home. An inquiry by health visitors showed that 497 out of 3,092 housewiv habitually ate or tasted raw sausage. The chief symptoms were swelling of the eyelids (8 and the face (61), muscular pains (77), headache, mostly frontal (72), photophobia (5 insomnia (46), constipation (29), stiff neck (26), lethargy (26), vomiting (24), disturbance balance (23), minor psychic disturbances (9); splinter haemorrhages of nails developed in t second or third week in eight cases and were of no value in early diagnosis. One case wi myocarditis was fatal. The origin of the infected pig or pigs was not ascertainable. R.T

(13k) In view of the impossibility of tracing back beyond the abattoir the pig whi caused the outbreak of trichinelliasis in Liverpool in 1953, and the cattle with cysticercia which Griffiths investigated in 1949, it is suggested that the recording of movements of sto deserves the serious attention of the Ministers of Health and Agriculture. R.T

(13m) Preoccupation with anthelmintic treatment for Enterobius infection may result in the underlying causes being ignored. Cotterell enquires what the conditions are which favour hatching in the bowel and if infection is detrimental apart from the anal irritation and very rare blocking of the appendix. R.T.L.

14—Bulletin de l'Institut Français d'Afrique Noire. Série A: Sciences Naturelles.

a. EUZET, L., 1954.—" Parasites de poissons de mer ouest africains récoltés par J. Cadenat. I. Cestodes tétraphyllides de sélaciens. (Note préliminaire.)." **16** (1), 126–138.
b. CADENAT, J., 1954.—" La collection de parasites de poissons de mer ouest africains de la Station de Biologie Marine de Gorée." **16** (1), 300–301.

(14a) Three species of *Rhinebothrium* are described from selachian fishes caught off West Africa. *R. minimum* Van Beneden, 1850 is redescribed and figured. *R. monodi* n.sp. from *Taeniura grabata* differs from *R. shipleyi* in possessing 17 loculi in each sucker and 60–80 testes. *R. cadenati* n.sp. from *Zanobatus* (*Platyrhina*) *shoenleini* differs from *R. flexile* in having only four loculi in each sucker. R.T.L.

(14b) Cadenat tabulates the number of helminths and leeches present in the collection of parasites of marine fishes of West Africa at the station of marine biology at Gorée. R.T.L.

15—Bulletin de la Société de Pathologie Exotique.

a. DESCHIENS, R., LAMY, L. & REYNAUD, R., 1954.—" Sur l'action anthelminthique de désoxybenzoines basiques dans la bilharziose à *Schistosoma haematobium*." **47** (1), 71–77.
b. MAUZÉ, J. & ARNAUD, G., 1954.—" L'oxyde stanneux dans le traitement de la bilharziose intestinale." **47** (1), 77–79. [Discussion pp. 79–81.]
c. SCHWETZ, J., 1954.—" Sur un cas de bilharziose vésicale à *S. mansoni* ou, du moins, sur un cas de bilharziose avec nombreux oeufs à éperon latéral, sans oeufs à éperon terminal concomitant, dans les urines d'un garçon indigène de Kongolo (Congo Belge)." **47** (1), 81–83.
d. DESCHIENS, R., POIRIER, M. & LAMY, L., 1954.—" Sur l'action anthelminthique des dérivés de l'éthylène-diamine et de la pipérazine." **47** (1), 83–86.
e. CROSNIER, R., DARBON, A., MORAS, P. & LAURENS, L., 1954.—" Nouvelles observations de filariose lymphatique à *W. malayi* chez des rapatriés d'Indochine." **47** (1), 87–91.
f. BRUMPT, L. C. & SANG, H. T., 1954.—" Activité de la diéthylcarbamazine (hétrazan, notézine, banocide) contre les nématodes intestinaux." **47** (1), 170–178. [Discussion p. 178.]

(15a) [This is a fuller account of a paper published in *C. R. Acad. Sci., Paris*, 1954, **238**, 168–170. For abstract see No. 20a below.]

(15b) Mauzé & Arnaud have used stannous oxide very successfully in the treatment of intestinal schistosomiasis. Five out of the 38 cases treated are now reported on in detail. A dosage of 3 gm. to 4 gm. daily, given orally in three doses, for eight days is recommended. The only side effects observed were occasional nausea, vomiting and headaches and these were overcome by interrupting the treatment and giving soda water or gassy tonic water. In the discussion Lamy stated that he had not found stannous oxide to be very effective against *Schistosoma haematobium*. S.W.

(15c) Schwetz describes a case of schistosomiasis mansoni in which numerous eggs were present in the urine and only one was found in the faeces after repeated examination. The eggs had a very long spine and resembled those found in wild rodents. No eggs of *Schistosoma haematobium* were found. S.W.

(15d) Deschiens *et al.* report excellent results obtained with piperazine hydrate against Enterobius in man. Nine children and four adults were treated at dose rates of from 0·1 gm. to 0·2 gm. for children and 0·4 gm. for adults, given on eight consecutive days; this was followed by a week's rest and a further eight-day course. S.W.

(15e) Crosnier *et al.* describe four cases of lymphatic filariasis caused by *Wuchereria malayi*. Their observations confirm the work of Friess, Pierrou & Segalen published in *Bull. Soc. Path. exot.*, 1953, **46**, 1037–1063. S.W.

(15f) Brumpt & Sang have used 1-diethylcarbamyl-4-methyl piperazine citrate (hetrazan notezine and banocide) against intestinal nematodes in man. Sixty patients with single or occasionally, mixed infections of *Ascaris lumbricoides*, *Ancylostoma duodenale* and *Trichura trichiura* were treated; the drug was effective only against Ascaris at a dose rate of 10 mg per kg. body-weight. Many of the patients showed symptoms of intolerance. S.W

16—Canadian Journal of Comparative Medicine and Veterinary Science.

a. DOLMAN, C. E., 1954.—" Some ways in which animal health affects human health." 18 (2), 35–50.
b. LAFORTUNE, J. G., 1954.—" Bronchite vermineuse chez les bovidés." 18 (3), 78–82.
c. DALE, D. G., 1954.—" Strongyloidiasis in a dog." 18 (4), 138–140.

(16b) The death of a Jersey cow in the province of Quebec was found at autopsy to be due to the presence of *Dictyocaulus viviparus*. Similar symptoms had been observed in a number of other animals in the same herd over a period of years and included diarrhoea cachexia and a fall in milk yield; there was no cough in most cases and the faeces of several animals previously autopsied showed no evidence of helminth infection. P.M.B

(16c) As *Strongyloides stercoralis* is rare in dogs in Canada, Dale reports its presence in a puppy from the Montreal area. R.T.L

17—Canadian Journal of Public Health.

a. KUITUNEN, E., 1954.—" Walrus meat as a source of trichinosis in Eskimos." [Abstract of paper presented at the 21st Annual Meeting of the Laboratory Section, Canadian Public Health Association, Toronto, December 14–15, 1953.] 45 (1), 30.

(17a) Of 394 walruses caught in the Canadian Arctic, off Baffin Island, northern Quebec, Cornwallis Island, Chesterfield Inlet and Southampton Island, 17 were found to be infected with *Trichinella spiralis*. The only previous record in this host was from the west coast of Greenland. R.T.L

18—Canadian Journal of Zoology.

a. WOLFGANG, R. W., 1954.—" Studies on the endoparasitic fauna of Trinidad mammals X. Parasites of Chiroptera." 32 (1), 20–24.
b. WOLFGANG, R. W. & MYERS, B. J., 1954.—"*Gonocerca macroformis* sp.nov. (Derogenetinae: Hemiuridae) from the ovary of the cod." 32 (1), 25–29.
c. ANDERSON, R. C., 1954.—" *Ornithofilaria fallisensis* n.sp. (Nematoda: Filarioidea) from the domestic duck with descriptions of microfilariae in waterfowl." 32 (2), 125–137.

(18a) *Biacantha desmoda* n.g., n.sp. from the intestine of the vampire bat, *Desmodus rufus*, in Trinidad differs from other genera of the Strongylacanthinae in possessing cuticular hooks originating in the ventral hypodermis of the head. Although it closely resembles *Strongylacantha*, the hooks arise from the mouth and it has a wide subventral tooth. The bursal ray arrangement differs slightly and there is no cephalic cuticular expansion. This is apparently the first helminth to be recorded from this bat. R.T.L

(18b) *Gonocerca macroformis* n.sp. from the ovary of *Gadus callarias* caught off Newfoundland, differs from *G. phycidis* in maximum size (13 mm.), the more attenuated form of the anterior portion of the body and the peculiar division of the caeca into a thick-walled oesophagus-like anterior portion and a thin-walled posterior portion with a broad lumen. The acetabulum is placed slightly behind the middle of the worm in smaller worms and about the middle in larger specimens. R.T.L

(18c) *Ornithofilaria fallisensis* n.sp. from the subcutaneous tissues of *Anser domesticus* in Ontario is similar to *O. mavis* but the female is 24 mm. to 40 mm. in length, the oesophagus is only about half to one-third as long, the nerve ring and the vulva are more anterior and the vagina is six times as long. Four types of microfilariae from waterfowl are described but no

named, viz., from *Branta canadensis* in Illinois, *Anas rubripes* and *Aix sponsa* in Ontario, and *Anas crecca* in Scotland. A key for their differentiation from the microfilaria of *O. fallisensis* is given. R.T.L.

19—Chromosoma. Berlin & Heidelberg.

a. LIN, T. P., 1954.—" The chromosomal cycle in *Parascaris equorum* (*Ascaris megalocephala*): oogenesis and diminution." **6** (3), 175–198.

(19a) Lin presents a detailed, illustrated account of oogenesis in *Parascaris equorum*. The ends of each collective chromosome are heterochromatic and devoid of spindle fibres; the middle part is euchromatic. During the early stages of meiosis the heterochromatic regions unite to form a huge chromocentre and the euchromatic parts are almost indistinguishable, the tetrad resembling a "signet ring". During strepsinema and diakinesis the chromocentre parts into the eight heterochromatic ends of the four chromatids and the ring opens into a tetrad. The heterochromatic ends are excluded from the telophase nucleus so that there is no heterochromatin in somatic nuclei. S.W.

20—Comptes Rendus des Séances de l'Académie des Sciences. Paris.

a. DESCHIENS, R., LAMY, L., LIBERMANN, D., COTTET, J. & REYNAUD, R., 1954.—" Sur les propriétés anthelminthiques des désoxybenzoïnes basiques." **238** (1), 168–170.

b. TIMON-DAVID, T., 1954.—" Sur le développement expérimental d'un trématode cyclocoelidé: *Pseudhyptiasmus dollfusi* Timon-David 1950." **238** (3), 400–402.

(20a) A non-poisonous basic desoxybenzoin (1183TH), consisting of a mixture of about 90% diethylaminoethoxy-2,4-desoxybenzoin and 10% of its *bis* isomer, showed anthelmintic properties against *Rhabditis macrocerca* in vitro and oxyurids and Hymenolepis in mice; the *bis* isomer was the more active. Deschiens *et al.* have tested the mixture against human schistosomiasis. The dosage given was about 7 mg. per kg. body-weight daily for eight days, followed by seven days rest and then a further eight days treatment. Of 33 cases of schistosomiasis haematobia treated all showed clinical cure 21 days after the end of treatment; no eggs were found in the urine of 22 patients, one degenerating egg per slide was found in the urine of six and occasional eggs in the urine of the remaining five. A further case of schistosomiasis haematobia and five cases of schistosomiasis mansoni were treated with favourable results. S.W.

(20b) Timon-David infected 65 *Helicopsis arenosa* with eggs of *Pseudhyptiasmus dollfusi* collected from a magpie. On dissection about 3 months later, 55% of the snails were infected. The redia, cercaria and metacercaria are described. The excretory vesicle and the main excretory ducts were visible in the cercaria but the fine canals and flame cells could not be distinguished. The metacercariae encyst in the rediae. This has not been recorded hitherto in the Cyclocoelidae. S.W.

21—Cornell Veterinarian.

a. RUBIN, R., 1954.—" Studies on the common whipworm of the dog, *Trichuris vulpis*." **44** (1), 36–49.

(21a) Rubin describes and figures a lancet in the mouth of the larval stages and adults of *Trichuris vulpis* and two glandular structures near the junction of the oesophagus and intestine. Under optimal conditions the eggs embryonate in nine days. In experimentally infected dogs no larvae could be found before the 14th day after infection. Several 54-day-old larvae markedly resembled the adults. The spicule of the male was well defined. The uterus and vagina were developed but there was as yet no vulvar opening. The prepatent period ranged from 74 days to 87 days. *T. vulpis* was present in 8% of 250 dogs examined in Oklahoma. R.T.L.

22—Countryman. Nicosia.

a. PETRIS, M. A., 1954.—" Parasitic gastroenteritis." **8** (2), 18.
b. NEAVE, R. M. S., 1954.—" The use of sodium fluoride against round worms in pigs." **8** (4), 10–11.

(22a) In Cyprus, parasitic gastro-enteritis, locally known as "Tsillara" or "Maoula", which exists throughout the island is most prevalent during early winter when the rains have brought on the first grasses. It is the most important parasitic condition among the sheep and goats. Regular dosing with phenothiazine or copper sulphate during the prolonged dry season is recommended as at that time the climatic conditions sterilize the pastures. R.T.L.

23—Deutsche Tierärztliche Wochenschrift.

a. SHOHO, C., 1954.—" Epizootische cerebrospinale Nematodiasis (Setariasis) und ihre verzweigten Probleme." **61** (3/4), 25–32.

(23a) Shoho presents the first detailed account in a European language of the work of the Japanese commission which studied "lumbar paralysis" of sheep and goats in Korea during the years 1939 to 1944. He also reports on studies on the same diseases in sheep, goats and horses carried out in Japan. The condition has been proved to be due to *Setaria digitata* infection in an abnormal host; larvae penetrate the central nervous system and give rise to encephalo-myelomalacia. Shoho prefers to call the disease entity "epizootic cerebrospinal nematodiasis" rather than setariasis since he thinks it possible that the same condition may be also caused by other nematodes. He points out the importance of distinguishing between Japanese B-encephalitis and this nematode infection and considers that some cases diagnosed as encephalitis might well have been due to nematodes. The pathology of the infection is described in detail. Mortality is not very high and reinfection is rare [no figures are given]. In Korea only imported animals were affected; native goats remained free from infection. Although there is no definitive proof that the condition occurs in continents other than Asia, Shoho thinks it is a probability. He is also of the opinion that more attention should be paid to the possibility of its occurrence in man. A.E.F.

24—Discovery.

a. ELLENBY, C., 1954.—" The eelworm and the potato." **15** (1), 35–36.

25—Dokladi Akademii Nauk SSSR.

a. BEREZANTZEV, Y. A., 1954.—[The raccoon as a new host of *Trichinella spiralis*.] **94** (4), 791. [In Russian.]

26—Experimental Parasitology. New York.

a. THORSON, R. E., 1954.—" Effect of immune serum from rats on infective larvae of *Nippostrongylus muris*." **3** (1), 9–15.
b. KARTMAN, L., 1954.—" Frequency and intensity of *Dirofilaria immitis* infections in mosquitoes." **3** (1), 25–29.
c. URQUHART, G. M., 1954.—" The rabbit as host in experimental fascioliasis." **3** (1), 38–44.
d. BROWN, H. W., CHAN, K. F. & FERRELL, B. D., 1954.—" A study of the activity of chemotherapeutic agents on infections of *Syphacia obvelata* and *Aspiculuris tetraptera*." **3** (1), 45–51.
e. FAIRBAIRN, D., 1954.—" The metabolism of *Heterakis gallinae*. II. Carbon dioxide fixation." **3** (1), 52–63.
f. SMYTH, J. D., 1954.—" Studies on tapeworm physiology. VII. Fertilization of *Schistocephalus solidus* in vitro." **3** (1), 64–71.
g. HANSEN, M. F., PETRI, L. H. & ACKERT, J. E., 1954.—" Effects of aureomycin and vitamin B_{12} used separately as feed supplements on resistance of chickens to *Ascaridia galli* (Schrank)." **3** (2), 122–127.
h. MELENEY, H. E. & MOORE, D. V., 1954.—" Observations on immunity to superinfection with *Schistosoma mansoni* and *S. haematobium* in monkeys." **3** (2), 128–139.
i. THOMPSON, Jr., J. H., 1954.—" Host-parasite relationships of *Schistosoma mansoni*." **3** (2), 140–160.

j. SCHILLER, E. L., 1954.—" Studies on the helminth fauna of Alaska. XIX. An experimental study on blowflow [blow-fly] (*Phormia regina*) transmission of hydatid disease." **3** (2), 161–166.
k. MUSTAKALLIO, K. K. & SAIKKONEN, J. I., 1954.—" The distribution of quinacrine in *Taenia saginata*." **3** (2), 167–172.
l. ALDRICH, D. V., CHANDLER, A. C. & DAUGHERTY, J. W., 1954.—" Intermediary protein metabolism in helminths. II. Effect of host castration on amino acid metabolism in *Hymenolepis diminuta*." **3** (2), 173–184.
m. CORT, W. W., AMEEL, D. J. & VAN DER WOUDE, A., 1954.—" Germinal development in the sporocysts and rediae of the digenetic trematodes." **3** (2), 185–225.

(26a) Thorson found that when infective larvae of *Nippostrongylus muris* were kept in immune serum for six hours at 37°C. and then injected into rats significantly fewer adults developed in the experimental than in the control animals. When the larvae were washed three times with distilled water between removal from serum and injection into rats there was no significant difference in the numbers of adults recovered. If the period of exposure to immune serum was extended to twelve hours significant differences were obtained with both washed and unwashed larvae. As no damage to the larvae could be detected microscopically Thorson concludes that there is an interference with their normal metabolism. S.W.

(26b) Kartman fed about 200 mosquitoes of each of six species and two hybrids on a dog infected with *Dirofilaria immitis*. During the period of the experiment the microfilaraemia varied from 17,000 to 18,600 mf. per c.c. of blood. The percentages of females which became infected were: *Anopheles freeborni* 100%, *A. quadrimaculatus* 99·5%, *Culex pipiens* 29·8%, *C. quinquefasciatus* 39·9%, the two *Culex* spp. reciprocal crosses 38·0% and 43·2%, *Aëdes aegypti* 34·5% and *A. albopictus* 99·4%. In those species with an infection rate of 50% or less few individuals harboured more than 5 or 6 larvae but in those with an infection rate of nearly 100% many individuals harboured ten or more developing filariae. S.W.

(26c) Urquhart has devised a simple technique for infecting rabbits with known numbers of *Fasciola hepatica* cercariae. The snails were placed in tubes lined with cellophane upon which the liberated cercariae encysted; a piece of the cellophane with the required number of cercariae was then cut out and fed to the rabbit in a piece of cabbage stalk. From his experiments, in which females and castrated males were each infected with fifty 7-day-old cercariae, he concludes that the breed and sex of the rabbits, and the source of the cercariae did not affect the degree of infection. The average number of adult flukes recovered 63 days after infection was $18{\cdot}6 \pm 8{\cdot}8$. S.W.

(26d) Bacitracin (with and without the addition of sulphaguanidine), methylrosaniline, tetrachlorethylene, phenothiazine, benzylphenyl carbamate, thymyl-*N*-*iso*amylcarbamate, hexylresorcinol and oxytetracycline were tested against single and mixed infections of *Aspiculuris* and *Syphacia* in mice. From their experiments the authors conclude that the reduction in the worm burden is a more sensitive and reliable test than the complete elimination of the worms. In single infections benzylphenyl carbamate, thymyl-*N*-*iso*amylcarbamate and hexylresorcinol failed to give significant reductions of either worm and tetrachlorethylene and bacitracin (even with sulphaguanidine) were ineffective against *Aspiculuris*. In mixed infections all except tetrachlorethylene gave a significant reduction in the worm burden of both species. In a table the results are compared with those obtained using the same drugs against *Enterobius* in man. S.W.

(26e) From two series of experiments on 1,352 mg. and 1,576 mg. of *Heterakis gallinae* using tracer techniques with Carbon 14, Fairbairn has shown that these nematodes fix carbon dioxide rapidly and extensively when kept anaerobically in Krebs-Ringer bicarbonate medium, although there is a small net production of the gas. Two-thirds of the total was fixed in the carboxyl group of propionic acid and most of the remaining third in an acid believed to be succinic. The mechanism and end products of the fermentation were very similar to those of *Propionibacterium* fermentation. Fowl caeca were shown to produce bicarbonate constantly but not to accumulate it as the amounts of carbon dioxide present in caeca were scarcely larger

than would be accounted for by the experimental error of the method used. Although large proportion of the worm tissue is reproductive, ribonucleic acid represented more tha 90% of the nucleic acids present. S.W

(26f) Smyth has devised an apparatus in which plerocercoids of *Schistocephalus solidu* can be matured *in vitro* and in which they become fertilized and produce viable eggs. Th larvae are kept in cellulose tubing suspended in tubes containing horse serum; these ar shaken continuously in a water bath at 40°C. for 48 hours. Under these conditions most of th seminal receptacles become filled with spermatozoa and the eggs produced show a fertility u up to 77%. Better results are obtained when more than one larva is put into each piece c cellulose tubing. Plerocercoids cultured loose in the tubes of serum are not fertilized and th eggs which are produced either fail to develop or do so parthenogenetically. S.W

(26g) Although no spectacular symptoms or heavy mortality may occur in poultr flocks from infection with *Ascaridia galli*, the birds are retarded in growth and fail to reach th optimum market weight in the shortest possible time on the least amount of food. In exper ments on 512 non-sexed White Plymouth Rock chicks the highest mortality rate and incidenc of infection occurred in those fed on plant protein basic diet. When this diet was supplemente by aureomycin and vitamin B_{12} growth was stimulated whether the chicks were parasitized c not. The aureomycin interfered with the metabolism of the worms. Vitamin B_{12} indirectl restricted the number of parasites by increasing the host's resistance although it stimulate the growth of the worms. When used together their individual effect on the growth of th worms was nullified. R.T.I

(26h) It is confirmed that bisexual schistosome infections of monkeys produce immunit against reinfection with the same species and may produce slight immunity against anothe species. No evidence was obtained that infection with *Schistosoma mansoni* of one sex prevent the normal development to maturity of the other sex. Some cercariae can remain in the epi dermis for 72 hours but most of them rapidly reach the lymphatic blood vessels. In immun monkeys they are destroyed in the visceral blood vessels at a later stage of development. R.T.I

(26i) Venezuelan specimens of *Australorbis glabratus* do not acquire resistance to infec tion when exposed repeatedly to miracidia of *Schistosoma mansoni*. Mice infected with femal *S. mansoni* were not protected from subsequent infection by *S. mansoni* cercariae of both sexes. If the intervals ranged from a week to a month, mice exposed more than three time acquired resistance to a challenging dose and no new worms developed but the animals die as rapidly as from a single infection. Rats, and to a lesser degree guinea-pigs, have a natura resistance. They survive massive initial infection and reinfection. The eggs in the tissue and the worms in the blood vessels are destroyed. With multiple re-exposures this destructio of eggs and worms continues throughout their lives but is no indication of an acquired immunity This protective mechanism does not occur in mice or hamsters. R.T.I

(26j) Microtine rodents, the natural intermediate hosts for a species of *Echinococcu* which is present in foxes on St. Lawrence Island, Alaska, have been successfully used b Schiller to demonstrate experimentally that blow-flies, *Phormia regina*, can convey *Echinococcu* eggs to a susceptible intermediate host and thus spread hydatid disease. R.T.I

(26k) With the aid of a fluorescent microscope, Mustakallio & Saikkonen have demon strated that atebrin has a great affinity for the musculature of the suckers of *Taenia saginata* It probably abolishes the electro-chemical forces required for the attachment of the worm t the gut wall. This may explain the effective action of the drug as a taeniafuge. R.T.I

(26l) To explain the effects of castration of the rat on the rate of growth and egg produc tion of its internal parasites, transaminase activity in *Hymenolepis diminuta* has been studied its free and combined amino acid content has been determined and the fat deposition of worm from castrated and intact rats has been compared histologically. The four active transaminas

reactions in *H. diminuta*, especially that involving glutamate and oxalacetate in the formation of aspartate were reduced by castration and there was a large amount of fat deposition in worms. By transamination, amino groups are removed from amino acids present in excess amounts in the host's gut and attached to certain carbon fragments of carbohydrate degradation in the parasite, thus increasing the amount of amino nitrogen in its tissues. R.T.L.

(26m) The method of reproduction in the germinal sacs of digenetic trematodes has been a subject of controversy since 1842. The evidence that this represents a germinal lineage as first suggested by Leuckart in 1879 is reviewed and is accepted as practically conclusive. The different mechanisms evolved in different groups to increase the number of embryos in the germinal sacs are discussed and may, on further study, contribute towards the building of a more natural classification. It is pointed out that there are pitfalls in the use only of sections or of living material in this type of investigation. R.T.L.

27—Farming in South Africa.

a. ALEXANDER, R. A., 1954.—" Veterinary Services. A. Research. Helminthology." [Report of the Department of Agriculture for the year ended 31 August, 1953.] **29** (334), 61.

(27a) Comparative trials show that tetrachlorethylene is superior to phenothiazine as a hookworm remedy. Its effectiveness is very high when introduced directly into the abomasum. Attempts to produce infection with *Gaigeria* sp. by the mouth again failed but the application of the larvae on the skin behind the ears was followed by the appearance of eggs in the faeces about eight weeks later. Three months after the administration of ripe *Taenia saginata* eggs, only immature cysts were found in a lamb and a kid. This confirms previous conclusions that ovines and caprines do not act as efficient intermediate hosts. Although many cysticerci from game were examined all possessed an armed scolex, thus eliminating these animals so far, as vectors of *T. saginata*. Samples of measly game biltong were fed to dogs with negative results; apparently the process of salting, curing and drying had killed the cysticerci. Attempts to infect locally bred *Physopsis* with *Schistosoma* again failed. R.T.L.

28—Indian Veterinary Journal.

a. CHANDRASEKHARAN NAIR, K. P. & ANANTARAMAN, M., 1954.—" Cooperiasis in buffalo calves." **30** (4), 334–335.

b. KALAPESI, R. M. & PUROHIT, B. L., 1954.—"Observations on histopathology of morbid tissues from a case of natural infection with *Schistosoma spindalis* in a bovine." **30** (4), 336–340.

c. MOHAN, R. N., 1954.—" Treatment of *Ascaridia galli* in poultry with (a) carbon tetrachloride and (b) oil of chenopodium." **30** (5), 412–417.

(28a) Large nodules, each containing an adult but immature *Cooperia* sp., were present in the wall of the small intestine of *Bos bubalis* calves with a clinical history of dullness, emaciation, anaemia, diarrhoea and oedema of the lower jaw culminating in death. R.T.L.

(28b) A detailed description is given of the lesions found in a bullock which had a natural infection of *Schistosoma spindale* and came from the west Khandesh district of Bombay State where there was an outbreak of this disease. There were small pseudo-tubercles under the visceral pleura and similar tubercles were numerous on the cut surface. A thrombus entangling a degenerated schistosome and free parasites in copula were found in the pulmonary vessels. Numerous pseudo-tubercles were apparent in the cut surface of the liver but none on the external surface and numerous paired worms were present in the portal veins. In some cases the lumen was completely obliterated and there were wide necrotic areas in the liver parenchyma. The mesenteric vessels contained clusters of parasites. There were pseudo-tubercles in the submucous and subserous layers of the large intestine. Some of the mesenteric veins contained large numbers of paired worms and some were completely occluded by thrombi. On two later occasions, additional specimens were received from Bombay State. R.T.L.

(28c) For the treatment of *Ascaridia galli* in poultry, Mohan, on the basis of a series of trials, recommends the administration of carbon tetrachloride to the entire flock at the dose rate of 0·75 c.c. to 1 c.c. per lb. body-weight, up to a maximum of 2 c.c. per bird. The treatment should be repeated after about four weeks and at intervals of four to six weeks for some months. A fine bore rubber tube attached to a syringe is used to introduce the carbon tetrachloride through the mouth into the crop. Boiling water is the simplest agent and one of the most effective for sterilizing metallic and wooden fittings. The diet should be rich in protein and supplemented by protective foods. Shark liver oil may be added when necessary. Oil of chenopodium which is more costly than carbon tetrachloride is rather difficult to administer and is no more efficient. In India *Ascaridia galli* is by far the most important helminth in fowls and heavy infections cause considerable mortality in chickens. R.T.L.

29—Journal of the American Veterinary Medical Association.

a. JONAS, S., 1954.—" Calcified intestinal nodules in a dog." **124** (922), 15–17.
b. ALICATA, J. E., 1954.—" A new method for the control of swine kidney worms." **124** (922), 36–39.
c. TODD, A. C., POPE, E. P. & MENDLOWSKI, B., 1954.—" *Ascaris lumbricoides*, an aberrant parasite in a lamb." **124** (922), 39.
d. DENNIS, W. R., STONE, W. M. & SWANSON, L. E., 1954.—" A new laboratory and field diagnostic test for fluke ova in feces." **124** (922), 47–50.
e. COOPERRIDER, D. E. & HAYES, F. A., 1954.—" Crystalline hexylresorcinol in the treatment of ascariasis and ancylostomiasis in Canidae." **124** (924), 191–193.
f. COOPERRIDER, D. E., ROBINSON, V. B. & STATON, L. B., 1954.—" *Dioctophyma renale* in a dog." **124** (926), 381–383.
g. ELDER, C., 1954.—" Dracunculiasis in a Missouri dog." **124** (926), 390–391.

(29a) Radiographs of the abdomen of a dog seven years old, are reproduced and show numerous opaque bodies varying in size from a pinhead to a small pea. Sections of a portion of small intestine, obtained by laparotomy, revealed that there were calcified nodules with necrotic centres "probably due to parasitism, perhaps of the Oesophagostomum type" although oesophagostomiasis has not been reported in canines. R.T.L.

(29b) Kidney disease due to *Stephanurus dentatus* infection is one of the most important problems in pig production in many parts of the world including some areas of the U.S.A., Australia, the Philippines and the Hawaiian Islands. The eggs are passed in the urine and hatch in the soil. The larvae enter the host through the skin from wet contaminated ground. Alicata has recently shown that "polybor-3", a commercial product composed of sodium pentaborate tetrahydrate and sodium tetraborate pentahydrate is a good and relatively non-toxic larvicide. When infected soil is sprayed at the rate of 5 lb. of polybor-3 in 3 gallons of water to 100 sq. ft. infective larvae are destroyed in about three weeks, and for about four weeks after spraying newly hatched larvae are killed. Two plans for rearing pigs are outlined and illustrated by diagrams. In one, the sow and young pigs are kept wholly on concrete floors, in the other they are raised on open lots with access for the young to a lot which has been sprayed with polybor-3 at least four weeks before the sow is due to farrow. R.T.L.

(29c) About 20 specimens of *Ascaris lumbricoides* were recovered from the bile passages of the lobes of the liver and a few specimens from the rumen of a lamb two months old The largest specimen measured 64 mm. in length. R.T.L.

(29d) The various techniques for liver-fluke diagnosis are reviewed and a simple, economical, speedy and efficient way of examining faecal samples from cattle, sheep and goats for fluke eggs is described and illustrated. The method depends on the use of a detergent solution to free the faecal material and suspend the colloidal colouring matter in solution, thus allowing the eggs to sink rapidly as a small sediment. The equipment and procedure are set out in detail. Of 25 detergents tested, the most satisfactory were "joy" and "glim". The addition of tincture of iodine stains the egg-shells. The use of a flat-bottomed counting dish scribed with lines $\frac{1}{4}$ in. apart is recommended for accurate observation and counting of the microscopical field. R.T.L.

(29e) Earlier reports on the efficacy of hexylresorcinol in removing hookworm and ascarids from dogs are confirmed by observations on 25 dogs; 98·1% of the ascarids and 84·2% of the hookworms were removed but, contrary to previous reports, the drug had no effect on the whipworms. The effect on *Dipylidium caninum* and *Spirocerca lupi* was inconclusive. R.T.L.

(29f) Thirteen *Dioctophyme renale* were found at autopsy in the peritoneal cavity and one in the pelvis of a ruptured kidney of a dog from North Carolina. R.T.L.

(29g) *Dracunculus insignis* in a dog is reported for the first time from Missouri. Eleven worms were removed from the front and hind legs by the owner. R.T.L.

30—Journal of Helminthology.

a. SMITHERS, S. R., 1954.—"On a new anoplocephalid cestode, *Pulluterina nestoris* gen. et sp.nov., from the kea (*Nestor notabilis*)." **28** (1/2), 1–8.
b. DUNN, A. M., 1954.—"The preparation of helminth antigen from fresh *Bunostomum trigonocephalum*." **28** (1/2), 9–16.
c. ALI, S. M. & SINGH, S. N., 1954.—"On a new nematode, *Buckleynema buckleyi* gen. et sp.nov. (Quimperiidae) from a siluroid fish in Hyderabad-Deccan." **28** (1/2), 17–24.
d. SINGH, S. N., 1954.—"Studies on the morphology and life-history of *Strongyloides mirzai* n.sp. from snakes in India." **28** (1/2), 25–34.
e. CROFTON, H. D., 1954.—"The vertical migration of infective larvae of strongyloid nematodes." **28** (1/2), 35–52.
f. PARNELL, I. W., RAYSKI, C., DUNN, A. M. & MACKINTOSH, G. M., 1954.—"A survey of the helminths of Scottish hill sheep." **28** (1/2), 53–110.
g. SEINHORST, J. W., 1954.—"On *Trichodorus pachydermus* n.sp. (Nematoda: Enoplida)." **28** (1/2), 111–114.
h. STANILAND, L. N., 1954.—"A modification of the Baermann funnel technique for the collection of nematodes from plant material." **28** (1/2), 115–117.

(30a) Smithers describes *Pulluterina nestoris* n.g., n.sp. from the kea in the London Zoo where it was evacuated by the host; the scolex was not recovered. The specimen is 590 mm. long and consists of 876 segments, with a single set of reproductive organs and irregularly alternating genital pores. The author refers this new genus to the subfamily Anoplocephalinae on account of its persistent uterus and differentiates it from the four genera *Aporina*, *Killigrewia*, *Hemiparonia* and *Triuterina* which possess a single set of genitalia. The uterus of the new worm is distinctive, consisting of a transverse tube in the posterior part of the segment with long, parallel diverticula extending to the anterior border. J.J.C.B.

(30b) Dunn gives an account of an investigation into the possibility of developing an antigen from helminth material readily available in the field and for this purpose chose *Bunostomum trigonocephalum*, on account of its common occurrence, ease of identification and large size. In preliminary experiments an antigen of appreciable potency and low anti-complementary effect was prepared from this helminth; further investigations were carried out which resulted in a satisfactory antigen for serological studies of nematode infections in sheep. The routine preparation and use of the antigen is described in detail. J.J.C.B.

(30c) Ali & Singh describe *Buckleynema buckleyi* n.g., n.sp., a new nematode which was collected from the intestine of the catfish, *Mystus cavasius*, in Hyderabad. They assign the new genus to the family Quimperiidae and differentiate it from the existing four genera. Of the latter, *Gendria* Baylis, 1930 has the closest resemblance to the new genus which differs from it, however, in the shape of the oesophagus, the number of teeth in the mouth, the presence of a pair of cervical glands and the presence of distinct "phasmids" or caudal pores in the male tail. J.J.C.B.

(30d) Singh found that the rat-snake *Ptyas* (*Zamenis*) *mucosus* was commonly infected with *Strongyloides* in Hyderabad, some specimens containing 100–125 worms, which occurred in the oesophagus and intestine, especially in the duodenum. He describes the morphology of

the parasitic and free-living adults and also the larval stages, and regards it as a new species. *Strongyloides mirzai*, with which *S. stercoralis* var. *eryxi* Mirza & Singh, 1935 is considered to be synonymous. The parasitic female which is 2·67–3·69 mm. long has a characteristic twisting of the ovarian tubules and a post-anal swelling of the body-wall. Embryonated eggs are passed in the faeces (rhabditiform larvae are rarely seen in faeces) and hatch in 3–4 hours in culture. Sometimes the larvae develop to the filariform stage without going through the free-living adult phase. The mode of infection of snakes could not be determined but is thought to be oral. Attempts to infect dogs were unsuccessful. J.J.C.B.

(30e) Crofton made detailed observations on the movements of infective larvae of *Trichostrongylus retortaeformis*, mixed trichostrongyles from sheep (mainly *Trichostrongylus* spp.) and *Trichonema* spp. from horses. Horizontal and vertical movements were observed on a glass slide; movements of larvae along channels were studied by means of specially constructed slides and the effects of a drying water film on the movements were observed in a glass chamber. It was found that both on a vertical and horizontal plane the larval movements are random at temperatures of 16–17°C. and at 27°C. It is concluded that the movements in a vertical plane have no reference to geotropism. In narrow channels the distance moved was approximately proportional to the time (T) and in wide channels to $\sqrt{T}$. Some of the larvae in a water film which was allowed to dry were seen to move away from the edge of the drying film but the majority were left on the dry part of the slide, the number being roughly correlated with the rate of drying of the water film. J.J.C.B.

(30f) Parnell *et al.* carried out a survey to determine seasonal and regional incidences of helminths of Scottish hill sheep and their economic importance. Worm counts were made from 720 abdominal and thoracic viscera sent from 80 farms. The sheep had died from disease or accidents and data were available as to their sex, age, breed, condition, date and place of death, suspected cause of death and previous anthelmintic treatment. The survey revealed that serious loss is caused by worms and suggests that nematodes contribute to the death of about 15% of the estimated annual death rate of gimmers and ewes and 26% of that of hoggs. There is also considerable loss from subclinical helminthiasis. The results of the survey are discussed at length and presented in the form of numerous graphs and tables which indicate the seasonal and regional incidence of the more important species of helminths. Recommendations are made for prophylactic dosing programmes in regard to the principal helminths. *Bunostomum trigoncephalum* is thought to be the most pathogenic nematode and is prevalent throughout the hill flocks. *Haemonchus contortus* is not widespread and normally is not a serious problem. *Ostertagia* spp. are the most numerous of the nematodes. *Cooperia curticei*, *Nematodirus* spp., *Strongyloides papillosus*, *Capillaria longipes* and *Trichuris ovis* are thought to be of less importance in Scottish hill sheep. Three species of *Trichostrongylus* occur, of which *T. vitrinus* is the most numerous and is one of the main causes of helminthiasis in hoggs in late winter and spring. *Chabertia ovina* occurs in numbers, especially in late winter and early spring, sufficient to merit consideration in prophylactic dosing programmes. *Dictyocaulus filaria* is sometimes harmful. *Fasciola hepatica* may be serious on some of the hills but its distribution is erratic. J.J.C.B.

(30g) Seinhorst describes *Trichodorus pachydermus* n.sp. which was the main nematode species in soil samples from trees (*Prunus serotina*) and shrubs at Ede, Holland. It was also found in small numbers elsewhere together with *T. primitivus*. It is distinguished from the latter species by the presence of a bursa in the male, two terminal papillae and in the form of the spicules. In both sexes the oesophageal bulb is about half as long as the oesophagus. J.J.C.B.

(30h) Staniland devised a modification of the Baermann funnel technique to facilitate the collection of large numbers of nematodes, e.g. from "tulip-rooted" oats with stem eelworm. It has the advantage of eliminating much of the plant debris which may be present and obtaining the nematodes in a small volume of water. The apparatus is described in detail and illustrated by a diagram. J.J.C.B.

31—Journal of Parasitology.

a. BYRD, E. E. & SCOFIELD, G. F., 1954.—"Developmental stages in the Digenea. III. Observations on the number of daughter sporocysts and cercariae produced in *Physa gyrina* as a result of single and multiple ochetosomatid egg-exposures." **40** (1), 1–21.
b. FREEMAN, R. S., 1954.—"*Paradilepis rugovaginosus* n.sp. (Cestoda: Dilepididae) from the osprey, with notes on the genus *Oligorchis* Fuhrmann, 1906." **40** (1), 22–28.
c. HOPKINS, S. H., 1954.—"*Cercaria brachidontis* n.sp. from the hooked mussel in Louisiana." **40** (1), 29–31.
d. SADUN, E. H. & VAJRASTHIRA, S., 1954.—"The effect of maklua (*Diospyros mollis*) in the treatment of human hookworm." **40** (1), 49–53.
e. HERLICH, H., 1954.—"The life history of *Nematodirus helvetianus* May, 1920, a nematode parasitic in cattle." **40** (1), 60–70.

(31a) The number of cercariae shed by *Physa gyrina* each exposed successfully to infection with one egg of *Dasymetra conferta* ranged from 12 to 707. When similarly infected with *Neorenifer orula* the snails discharged from 2 to 619, with *N. aniarum* from 20 to 2,743 and with *Ochetosoma ellipticus* from 60 to 2,816 cercariae. Each snail had been kept isolated throughout the entire shedding period which extended over a mean of 39·2 days for *D. conferta*, 33·5 days for *N. orula*, 26·3 days for *N. aniarum* and 60·8 days for *O. ellipticus*. All the snails died naturally. In every case there was an initial flushing out of cercariae followed by more or less rhythmical decreases and increases. Each mother sporocyst gave rise in *N. aniarum* to 31 to 72 daughter sporocysts and in *O. ellipticus* to 27 to 110 daughter sporocysts. R.T.L.

(31b) *Paradilepis rugovaginosus* n.sp. from an osprey, *Pandion haliaetus carolinensis*, from Ontario can be distinguished from the other species of the genus by the peculiar rugate structure of the vagina in which long cilia are arranged to correspond with the rugae. It differs from *Paradilepis simoni*, the other species found in the osprey, by (i) the distinct strobilar segmentation, (ii) the presence of only four testes and (iii) the distance of the genital primordia from the scolex which is 15 mm. instead of 2 mm. The number of hooks is 32 whereas in *P. simoni* it is 36. A key is given to the 11 species of *Paradilepis* now recognized including four new combinations, viz., *P. burmanensis* (Johri, 1941) n.comb. and *P. longivaginosus* (Mayhew, 1925) n.comb. transferred from *Oligorchis*, and *P. minima* (Goss, 1941) n.comb. and *P. yorkei* (Kotlán, 1923) n.comb. transferred from *Dilepis*. R.T.L.

(31c) The gonads of *Brachidontes recurvus*, a mussel collected in Barataria Bay, Louisiana, were completely destroyed by orange pigmented sporocysts full of tailless cercariae now named *Cercaria brachidontis* n.sp. The cercaria has long intestinal caeca. The bladder is Y-shaped. The flame cell formula is 2[(2+2)+(2+2)]. Stylet and penetration spines are lacking. R.T.L.

(31d) The berries of *Diospyros mollis* (Ebenaceae) which grows wild almost everywhere in Thailand have been used for many years past as an intestinal anthelmintic but hitherto no data have been published. Preliminary experiments were made on 112 patients in out-patient field clinics. The green berries crushed in coconut milk were given in a single dose and resulted in low hookworm egg counts when the faeces were examined 90 days later, but the conditions rendered it impossible to attempt to recover the adult worms from the faeces. R.T.L.

(31e) The ova of *Nematodirus helvetianus* are extremely resistant to cold and develop normally after exposure for 21 days to −10°C. Within the shell the larva undergoes moults and retains both sheaths until hatched. At 28°C. to 29°C. hatching may occur in 8–10 days. The first sheath is then shed. The second sheath is shed in the small intestine of the calf. The third-stage larva in the host is easily recognized by the forked tail and median rod-shaped process. By the eighth day after infection the larva is at the fourth stage and is free in the lumen of the small intestine. By the 15th day it has become a fifth-stage larva. Extensive penetration of the gut wall by the early stages was not noticed, but in a calf harbouring fifth-stage larvae there was catarrhal inflammation and some destruction of villi. The prepatent period lasted from 21–26 days and the patent period from 12–132 days. A calf which had been infected experimentally when one month old and was successfully superinfected when three months old was resistant to reinfection when six months old. R.T.L.

31—Journal of Parasitology (cont.)

f. CABLE, R. M., 1954.—" Studies on marine digenetic trematodes of Puerto Rico. The life cycle in the family Haplosplanchnidae." **40** (1), 71–76.
g. READ, C. P. & VOGE, M., 1954.—" The size attained by *Hymenolepis diminuta* in different host species." **40** (1), 88–89.
h. WU, L. Y. & KINGSCOTE, A. A., 1954.—" Further study on *Lymnaea stagnalis* (L.) as a snail host for *Fascioloides magna* (Bassi, 1875) (Trematoda)." **40** (1), 90–93.
i. CAMPBELL, W. C. & TODD, A. C., 1954.—" Natural infections of *Fascioloides magna* in Wisconsin sheep." **40** (1), 100.
j. COIL, W., 1954.—" Observations on the biology of *Acetodextra amiuri* (Stafford, 1900) Pearse, 1924, in Lake Erie." **40** (1), 101.
k. BENTON, A. H., 1954.—" Notes on *Moniliformis clarki* (Ward) in eastern New York (Moniliformidae: Acanthocephala)." **40** (1), 102–103.
l. LUTTERMOSER, G. W., 1954.—" Studies on the chemotherapy of experimental schistosomiasis. I. A method for detecting schistosomacidal activity based on response of *Schistosoma mansoni* infections in mice to fuadin therapy." **40** (2), 130–137.

(31f) Cable now gives a detailed account of the life-cycle of *Haplosplanchnus acutus*. [See also Helm. Abs., **21**, No. 230de.] The cercaria is biocellate, it has a rhabdocoele intestine and its slender tail has eight pairs of lateral finger-like processes and a terminal one. It develops in simple sporocysts in the branchial region of *Cerithium variabile*. A second intermediate host is apparently unnecessary. The cercariae encyst in the open and are probably ingested with vegetation by fishes. A complete series of developmental stages from the encysted cercariae to adults was found in the intestine of naturally infected *Hyporhamphus unifasciatus*, and adults were recovered from the needle-fish, *Strongylura* sp. R.T.L.

(31g) Individual specimens of albino mice, albino rats, hooded rats and hamsters were each infected with a single cysticercoid of *Hymenolepis diminuta* obtained from experimentally infected and laboratory-reared *Tenebrio molitor*. The significant differences in size attained by *H. diminuta* in these various hosts are tabulated and appear to be related to the weight of the host and more particularly to the size of its small intestine. R.T.L.

(31h) The rediae of *Fascioloides magna* develop in the respiratory chamber, liver, mantle and margin of the foot in *Limnaea stagnalis*. The development is much slower than in *Fossaria parva* and the daughter rediae are smaller. The mother redia takes over four months to develop. As heavy infections are lethal to the snails it is thought that *L. stagnalis* may not be a normal intermediate host. R.T.L.

(31i) Three instances of death due to natural infection by *Fascioloides magna* have been observed in northern Wisconsin sheep. R.T.L.

(31j) *Acetodextra amiuri* has been found in the bladder or ovary of *Ameiurus nebulosus*, *A. natalis*, *A. melas*, *Noturus flavus* and *Cottus bairdii* in Lake Erie. The adults apparently became decomposed and the eggs remain embedded in mucus. Those in the ovary are probably expelled during spawning and those in the air bladder probably leave their host via the ductus pneumaticus and the alimentary canal. R.T.L.

(31k) *Moniliformis clarki* is reported for the first time from *Microtus p. pennsylvanicus*. It is common in *Pitymys pinetorum scalopsoides* at Kingston, Ulster County, New York. It is noted that Van Cleave omits from his list Doran & Read's record of its occurrence in *Onychomys torridus* in California. R.T.L.

(31l) Luttermoser describes a technique for testing the efficacy of drugs against *Schistosoma mansoni* in mice. Young female mice weighing from 12–18 gm. were exposed to known numbers of cercariae (from 250 to 900 per animal) by the tail immersion technique; groups were then given graded doses of fouadin twice daily for ten days starting on the 35th day after infection. The criteria of activity were the increased survival time of the mice and the presence of dying or dead *S. mansoni* in the livers at autopsy. Six other drugs, including miracil-D, were tested in the same way. S.W.

31—Journal of Parasitology (cont.)

m. ROBINSON, Jr., E. J., 1954.—" Notes on the occurrence and biology of filarial nematodes in southwestern Georgia." **40** (2), 138–147.
n. LE ZOTTE, Jr., L. A., 1954.—" Studies on marine digenetic trematodes of Puerto Rico: the family Bivesiculidae, its biology and affinities." **40** (2), 148–162.
o. MOORE, D. V., YOLLES, T. K. & MELENEY, H. E., 1954.—" The relationship of male worms to the sexual development of female *Schistosoma mansoni*." **40** (2), 166–185.
p. CABLE, R. M., 1954.—" Studies on marine digenetic trematodes of Puerto Rico. The life cycle in the family Megaperidae." **40** (2), 202–208.

(31m) Vertebrates numbering 1,237, of which 1,006 were birds, 94 were mammals, 137 were reptiles and 35 were amphibians, were collected in a limited part of south-western Georgia and were examined for filarial infections. Eight of the mammals (representing four species) and 234 of the birds were found positive. No specific identifications were made but the number of infected animals of each species is tabulated. As juvenile birds of 11 species were found infected during the nesting season, the vectors probably attacked the birds in their nests. R.T.L.

(31n) Specific diagnoses are given of cystocercous cercariae found in *Cerithium* in Puerto Rico. They are named *Cercaria caribbea XLIII* to *XLVIII*. *XLIII* occurred in *Cerithium variabile*, *XLVII* in *C. floridanum*, and *XLIV*, *XLV*, *XLVI* and *XLVIII* in *C. algicola*. The unique characters of the digestive and excretory systems and the complete agreement between the cercarial stage and adults of the family Bivesiculidae render it certain that these cercariae belong to this family, although attempts to infect fish gave negative results. The only mature bivesiculids found in naturally infected fishes were *Bivesicula hepsetiae* which occurred in 55 out of 109 *Atherinomorus stipes*. The adult, egg, miracidium, redia and cercaria are described and figured. It is suggested that the term "furcocystocercous" be used to distinguish the fork-tailed cercariae of Azygiidae and Bivesiculidae from other cystocercous cercariae such as those of Gorgoderidae. Bivesiculidae, formerly associated with Monorchidae, and Azygiidae are allocated to Strigeatoidea. Le Zotte proposes that the subfamily Transversotreminae, which Witenberg created for *Transversotrema haasi* without assigning it to any family, should be raised to family rank as Transversotrematidae n.fam. with *Transversotrema* as type and only genus and with *Cercaria pataliensis* and *C. koliensis* as probable larvae. These unusual cercariae which have adult characters far advanced in development like those of *T. haasi*, and a furcocercous tail with a unique process at the base have already been referred, with *T. haasi*, to the Strigeatoidea by Olivier. R.T.L.

(31o) Details are given of six experiments which confirm that in mice female *Schistosoma mansoni* cannot attain sexual maturity in the absence of male worms. It was also found that for this purpose the male worms must be mature. Female worms developed from unisexual infections did not attain sexual maturity when a particulate suspension of desiccated mature male worms was injected intraperitoneally into the host, when the host received injections of testosterone propionate or when living mature male worms were implanted in the host's peritoneal cavity. Unisexual female worms, 315 days old, completed their sexual development and maturation when fertilized by male worms. The rate of growth and sexual maturation of a unisexual female infection of 11 weeks' duration was not significantly affected either by the introduction of male worms into the host or when female worms were introduced into a host which harboured only mature males, as compared with the rate following a simultaneous introduction of males and females into a host. R.T.L.

(31p) Cable, who gave in 1952 the first account of the life-cycle in the family Megaperidae [for abstract see Helm. Abs., **21**, No. 230de], now describes in more detail the redia and cercaria of a *Megapera* found in *Crepidula convexa* and believed on oecological evidence to be those of *M. gyrina* which was present in numbers in *Lactophrys tricornis*. The cercaria encysts in the open. From consideration of morphological and oecological data, Cable concludes that Megaperidae and Lepocreadiidae are closely related. R.T.L.

31—Journal of Parasitology (cont.)

q. SMITH, C. F., 1954.—" Studies on *Quinqueserialis hassalli* and taxonomic considerations of th species of *Quinqueserialis* (Trematoda: Notocotylidae)." **40** (2), 209–215.
r. EYLES, D. E., GIBSON, C. L., JONES, F. E. & CUNINGHAM, M. E. G., 1954.—" Pre valence of *Dirofilaria immitis* in Memphis, Tennessee." **40** (2), 216–221.
s. LEHMANN, D. L., 1954.—" Some helminths of west coast urodeles." **40** (2), 231.
t. HOFFMAN, G. L., 1954.—" The occurrence of *Ornithodiplostomum ptychocheilus* (Faus (Trematoda: Strigeida) in fish and birds." **40** (2), 232–233.
u. DEWITT, W. B., 1954.—" A useful technique for exposure of animals to cercariae of *Schisto soma japonicum*." **40** (2), 234.

(31q) A detailed study of the morphological variations in 176 specimens of *Quinqueserial hassalli* showed that the number of papillae in ventral rows, the form and distribution o vitellaria, the length of metraterm in relation to that of the cirrus sac, and the egg size var considerably. It is pointed out that the differentiation of the four known species of *Quin queserialis* has been based on those characters. *Q. floridensis* and *Q. hassalli* constantly diffe from *Q. quinqueserialis* for their uterine coils extend laterally beyond the intestinal caec *Q. wolgaensis* is considered a synonym of *Q. hassalli*. In *Q. floridensis* the vitellaria are almo wholly posterior to the uterine loops, whereas in *Q. hassalli* they extend anteriorly from th testes to within a third of the distance to the cirrus sac but its validity must remain uncertai until established by feeding experiments or life-cycle studies. As *Notocotylus noyeri* differ from *Q. hassalli* in possessing only three rows of papillae, its specific identity should be con sidered. R.T.L

(31r) In 618 stray dogs, mostly collected from the city of Memphis over a period of 2 months, the average infection with *Dirofilaria immitis* was 15·2%. The microfilarial densit averaged 600 per c.c. and the mean adult worm burden was 7·2 per infected dog. Of 204 dog autopsied, 4·9% had adult worms in the heart and the pulmonary artery. R.T.L

(31s) Five species of nematodes and three of trematodes were found in 99 specimen of urodeles belonging to eight species and five genera collected in central California and th Willamette Valley of Oregon. New hosts recorded are: *Ensatina escholtzii oreganus* fo *Brachycoelium salamandrae*; *Triturus granulosus* for *B. salamandrae*, *Megalodiscus americanu Cosmocercoides dukae* and *Hedruris siredonis*; *Ensatina escholtzii oreganus*, *E. e. escholtz Aneides ferreus* and *Batrachoseps a. attenuatus* for *Oxyuris dubia*; and *Aneides flavipunctat* for *O. magnivulvaris*. R.T.

(31t) The metacercaria of the strigeid *Ornithodiplostomum ptychocheilus* is reporte from North Dakota in four new hosts, viz., *Notropis cornutus frontalis*, *Pimephales p. promela Semotilus a. atromaculatus* and *N. d. dorsalis*. The cysts were present in the mesentery of a four fish and also in the extra-dural space in *N. d. dorsalis*. *O. ptychocheilus* was also found i cyprinids in Wisconsin. Egg-producing adults were found two days after feeding the meta cercariae to chicks; they showed only a slight strigeid constriction when alive and after h fixation, but this was lost after cold fixation and freezing. R.T.

(31u) Mice were infected by applying cercariae of *Schistosoma japonicum* by means a loop of human hair, 5 cm. to 6 cm. in length, the ends of which were held between the thum and forefinger and twisted. The size of the loop varied with the amount of twisting and shou range from 2 mm. to 5 mm. in diameter. Duco cement is spread along the twisted portio and cemented to the end of an applicator. The skin over the abdomen is clipped closel Anaesthesia for one or two hours is obtained by injecting nembutal intraperitoneally. Th skin is wetted by moistened fingers. The cercariae are looped off the surface of the water an are counted under a dissecting microscope before being applied. After their applicatio several drops of water are added to keep the skin wet. Uniformity of infection and the numb of worms reaching maturity compare favourably with the re ults obtained by other method The number of adults recovered from 64 mice, each exposed to 50 cercariae, ranged fro 41% to 94% with an average of 64·3%. R.T.

32—Journal of the South African Veterinary Medical Association.

a. KASCHULA, V. R. & MALHERBE, W. D., 1954.—" The incidence and diagnosis of spirocercosis in dogs in the Transvaal." **25** (1), 53–59.

(32a) When a mixture of equal parts of crystalline zinc sulphate, glycerin and water was used in the Faust flotation method, the ova of *Spirocerca lupi* were effectively floated. With this technique, 20 out of 100 dogs in the Transvaal were found to have these ova in their faeces. Hitherto a diagnosis has been possible only at autopsy as the ordinary routine 50% glycerin flotation method was completely ineffective. R.T.L.

33—Journal of Tropical Medicine and Hygiene.

a. JORDAN, P., 1954.—" Bancroftial microfilaraemia in hospital in-patients." **57** (1), 8–12.

(33a) The incidence of microfilariae of *Wuchereria bancrofti* in adult patients in Mwanza Hospital is tabulated in its relation to various diseases and clinical conditions. The microfilarial rate is much higher in febrile than in non-febrile conditions and in those with tissue damage than in those without. Although "mumu", the Pacific symptom complex characterized by recurrent attacks of severe lymphadenitis, does not appear to occur in East Africa a less severe form probably exists there. The microfilarial rate was high in tropical ulcers. The ulcers either predispose to bancroftian infection or infected persons are more susceptible to ulceration. It was also high in cases of abortion and in those with mental diseases. R.T.L.

34—Journal of the Washington Academy of Sciences.

a. SINGH, K. S., 1954.—" *Psilocollaris indicus* n.gen., n.sp. (Psilostomidae Odhner, 1911: Trematoda) from an Indian stork, *Dissoura e. episcopus*." **44** (1), 24–26.

b. DRECHSLER, C., 1954.—" A nematode-capturing fungus with clamp-connections and curved conidia." **44** (3), 82–85.

(34a) *Psilocollaris indicus* n.g., n.sp. from an Indian stork, *Dissoura e. episcopus*, shot near Lucknow, differs from the seven known genera of Psilostomidae in the possession of a definite collar which is unarmed. The oral sucker and pharynx are poorly developed and the arms of the Y-shaped excretory bladder are much elongated, extending to the anterior region of the anterior testis. The new genus is considered to represent a link between the Psilostomidae and the Echinostomidae. R.T.L.

(34b) Drechsler describes and figures another new species of clamp-bearing fungus which developed in maize-meal agar plate cultures to which small quantities of decaying vegetable detritus from a field in southern Louisiana had been added. The fungus named *Nematoctonus campylosporus* n.sp. attacked eelworms identified by Steiner as *Eucephalobus* sp. The worms were held captive through adhesion to the distal cell of a procumbent hypha extended from an assimilative mycelium in a nematode that had been captured earlier. Drechsler failed to get the conidia to germinate. R.T.L.

35—Lebensmitteltierarzt.

a. PETERS, W., 1954.—" Wertersatz für Trichinenschauproben." **5** (6), 67.

(35a) According to German law specimens of pig flesh used for Trichinella inspection, and which have been found to be sound, may be sold only as inferior quality meat. But these small pieces of meat are popular neither with butchers nor housewives and rarely sell; they usually have to be destroyed. Although the specimens should be of the size of a hazel-nut they are in practice usually much larger and over a period the loss sustained by the owners of carcasses is quite considerable. Peters points out that under present regulations owners can make no claim for compensation for losses sustained in this way. A.E.F.

36—Medycyna Weterynaryjna.

a. CZARNOWSKI, A. & WITKOWSKI, E., 1954.—" Zapalenie płuc u zająca wywołane prz larwy nicienia *Protostrongylus commutatus*." **10** (2), 63–64.

(36a) Czarnowski & Witkowski report a case of pneumonia in the hare produced b *Protostrongylus commutatus*. C.

37—Monatshefte für Veterinärmedizin.

a. BORCHERT, A., 1954.—" Ermittlung parasitärer Krankheiten durch die Kotuntersuchung **9** (2), 38–39.
b. EICHLER, W., 1954.—" Aerosolanwendung in der Parasitenbekämpfung." **9** (4), 85–86.

(37a) Borchert emphasizes the importance of faecal examination in the diagnosis helminth infections and presents two plates illustrating the more important helminth ova an larvae likely to be found in the faeces of domestic animals. A.E.

(37b) Eichler's short note is mainly concerned with the use of aerosols against ecto parasites but incidental reference is also made to Enigk's work on their value in the treatmen of lungworm disease in ruminants [for a full account see Helm. Abs., **22**, No. 116a]. A.E.

38—Nature. London.

a. DUDDINGTON, C. L., 1954.—" Nematode-destroying fungi in agricultural soils." [Corre spondence.] **173** (4402), 500–501.
b. WALLACE, H. R., 1954.—" Hydrostatic pressure-deficiency and the emergence of larva from cysts of the beet eelworm." [Correspondence.] **173** (4402), 502–503.
c. MUIR, D. A., 1954.—" Ants *Myrmica rubra* L. and *M. scabrinodis* Nylander as intermediat hosts of a cestode." [Correspondence.] **173** (4406), 688–689.
d. DUNN, E., 1954.—" Factors influencing the emergence of *Heterodera rostochiensis* larvae. [Correspondence.] **173** (4408), 780.
e. POYNTER, D., 1954.—" Second ecdysis of infective nematode larvae parasitic in the horse. [Correspondence.] **173** (4408), 781.
f. MACKERRAS, M. J. & SANDARS, D. F., 1954.—" Life-history of the rat lung-worm and it migration through the brain of its host." [Correspondence.] **173** (4411), 956–957.
g. INGLIS, W. G., 1954.—" Allometric growth in the Nematoda." [Correspondence.] **17** (4411), 957.

(38a) In an examination of 49 samples of soil taken from arable land infected wit *Heterodera rostochiensis* or *H. major* and from green-houses in which *H. rostochiensis* wa causing damage to tomatoes, a number of species of nematode-attacking fungi were found These are listed. *Arthrobotrys oligospora* and "Mycelium 186" occurred most commonly There was a preponderance of hyphomycetes which capture nematodes by means of adhesiv networks. *Acrostalagmus* n.sp., *Haptoglossa heterospora*, *Nematoctonus leiosporus* and *N pachysporus* are new records for Britain. R.T.

(38b) The behaviour of *Heterodera schachtii* larvae in the soil is governed by the proper ties of the soil water. Maximum emergence of the larvae from cysts corresponds to th pressure-deficiency at which the last pore space is emptied of water. Emergence also depend on oxygen concentration. At low concentrations, emergence is almost nil. It increases afte 10 cm. pressure-deficiency and rises to a maximum at 70 cm., followed thereafter by a decline It is suggested that hatching may be inhibited by the extraction of water from the cysts an emergence may be impeded by the surface forces of the water film. R.T.

(38c) *Myrmica rubra* and *M. scabrinodis* from heather moor in the west of Scotlan are reported for the first time as intermediate hosts of a cestode. The cysticercoids lie freel in the body-cavity and the scolex appears to be identical with that of the grouse cestode *Raillietina* (*Paroniella*) *urogalli*, which is common in the red grouse of the regions examined L.M.C

(38d) Seasonal variation in the emergence of *Heterodera rostochiensis* larvae from their cysts is not simply the result of a correlation between hatching and temperature. The rate and amount of emergence from viable cysts at 15°C. is markedly influenced by the maximum temperatures to which the moist cysts have been subjected prior to the addition of root diffusate. This may explain failures in tomato and potato crops where the cyst population levels are only moderate, and seems to explain the absence of winter dormancy reported by Fenwick. R.T.L.

(38e) Ecdysis of the third-stage larvae of several nematodes parasitic in the alimentary canal of horses occurs in filtered duodenal contents from freshly killed horses. The rate of ecdysis varied with the concentration. Normal ecdysis may be induced by boiled duodenal contents, pig or horse bile and by sodium taurocholate. In *Trichonema* spp., *Triodontophorus* spp. and *Oesophagodontus robustus* the ecdysis does not involve shedding a cap but results from the splitting of the sheath following the formation of a bulge in the oesophageal region. R.T.L.

(38f) *Angiostrongylus cantonensis* is present in the pulmonary arteries of about 5% of *Rattus norvegicus* in Brisbane. The intermediate hosts are *Limax* spp. The first-stage larva enters the foot of the slug. The first moult occurs in about 12 days and the second moult five days later at 70°F. to 74°F. The third-stage larva remains within the two cast skins until the slug is eaten by the rat. The larvae enter the mesenteric veins and reach the cerebral tissues where they grow and moult about the 12th day. The immature adults emerge and move freely in the subarachnoid space. On the 29th day after infection they travel by the veins to the lungs and by the 32nd day have reached the pulmonary arteries where egg-laying begins. First-stage larvae are found in the faeces on the 40th to 45th day. R.T.L.

(38g) A study of allometric growth in *Toxascaris leonina* indicates that the ratios of body-length to oesophagus, cervical alae, tail of male and of female and diameter of the head vary considerably in specimens of different body-length and that such simple ratios must be treated with some reserve in systematics. R.T.L.

39—New Zealand Veterinary Journal.

a. ARMSTRONG, M. C., 1954.—"Phenothiazine in dietary supplements for hoggets." [Correspondence.] **2** (1), 28.

b. ARMSTRONG, M. C., 1954.—"South Canterbury as a new locality for liver-fluke." [Correspondence.] **2** (1), 28.

(39a) When wintering hoggets were provided with a dietary supplement consisting of a proprietary food made from molasses and dried milk solids to which phenothiazine was added at the rate of 47 lb. per ton, the faecal egg count was reduced but the live-weight increase was not significant. On a stubble paddock the hoggets, although almost starved, refused the supplement. R.T.L.

(39b) Armstrong reports the occurrence, in fattened lambs from a farm near the Pareora River and ten miles from Timaru, of liver-fluke infection not sufficiently advanced to cause visible symptoms or to affect the grading. There were numerous snails identified as *Myxas ampulla*, a recognized vector of *Fasciola hepatica*, on the sides and bottom of a water trough on the farm. R.T.L.

40—Ohio Journal of Science.

a. ODLAUG, T. O., 1954.—"Parasites of some Ohio Amphibia." **54** (2), 126–128.

(40a) Odlaug lists the helminths and protozoan parasites collected in Ohio principally in the counties of Franklin and Hocking. The following helminths are recorded: *Distoichometra bufonis* in *Bufo americanus*; *Brachycoelium salamandrae*, *Plagitura salamandra*, *Crepidobothrium amphiumae*, *Cosmocercoides variabilis* and acanthocephalan cysts from *Desmognathus fuscus*; *Glypthelmins quieta* and *Oswaldocruzia pipiens* from *Hyla crucifer*; *Crepidobothrium rennbergi* from *Necturus maculosus*; *Brachycoelium salamandrae* and *Cosmocercoides variabilis*

from *Pseudacris triseriata*; *G. quieta* from *Rana catesbeiana*; *Gorgoderina tanneri* (reported fo the first time), *Cosmocercoides dukae* and acanthocephalan cysts from *R. clamitans*; *Gorgoderin attenuata*, *Haematoloechus complexus*, *Megalodiscus temperatus*, metacercariae of *Apharyng strigea pipientis*, *Rhabdias ranae*, *Oswaldocruzia pipiens*, *C. variabilis* and cysticerci (in th mesenteries) from *Rana pipiens*; *Brachycoelium salamandrae* (a new host record), *Oxysomatiu americanum* and encysted larval acanthocephalans from *R. sylvatica*. R.T.I

41—Parasitology.

a. ULLMAN, H., 1954.—" Observations on a new cercaria developing in *Melanopsis praemor* in Israel." **44** (1/2), 1–15.
b. GRESSON, R. A. R. & CORBETT, M. P., 1954.—" A morphological study of a fish tapeworm *Proteocephalus pollanicola*." **44** (1/2), 34–49.
c. FAHMY, M. A. M., 1954.—" An investigation on the life cycle of *Trichuris muris*." **44** (1/2 50–57.
d. HISCOCK, I. D., 1954.—"A new species of *Otobothrium* (Cestoda, Trypanorhyncha) fro Australian fishes." **44** (1/2), 65–70.

(41a) *Cercaria orospinosa* n.sp. which is common in *Melanopsis praemorsa* from th River Yarkon in Israel is figured and described. It belongs to the *pleurolophocerca* group o cercariae having one long dorsal and one short ventral tail fin. It is placed in an "artificial genus of cercariae now named *Velocercaria* but can be differentiated from those members o this group which have 20 penetration gland cells by the arrangement of the bundles of orifice of the gland ducts; every median bundle consists of four units while the lateral ones hav six orifices each. The metacercariae develop experimentally in *Bufo viridis*. The definitive hos is unknown. R.T.I

(41b) A more detailed account than hitherto available is given of the morphology an histology, especially of the reproductive system, of *Proteocephalus pollanicola* from *Coregonu pollan* collected in Lough Neagh, Northern Ireland. R.T.I

(41c) Fahmy has completed experimentally in laboratory mice the life-cycle of *Trichur muris*. The embryonated ova hatch in the lower part of the jejunum. There was no migratio into the lungs or into the mucosa of the small intestine. Free larvae were found in the caecu 2 hours 30 minutes after infection and all the larvae had reached the caecum within 24 hours Two moults occurred in the caecum, one on the 11th day and a second one on the 23rd day sexual maturity was attained in 34 days to 35 days from the date of infection. R.T.I

(41d) Cysts, 1 mm. to 6 mm. in diameter, in the body-cavity of *Mugil cephalus* an *Netuma australis* contained larval trypanorhynchs named *Otobothrium* (*O.*) *mugilis* n.sp. Th scolex and proboscis apparatus are described and figured. This is the first time that th parasite has been recorded from the mullet in Australian waters; 75% of those taken from th Brisbane River are infected. The adult is still unknown. R.T.I

42—Phytopathology.

a. ALLARD, R. W., 1954.—" Sources of root-knot nematode resistance in lima beans." **44** (1 1–4.
b. DROPKIN, V. H., 1954.—" Infectivity and gall size in tomato and cucumber seedlings infecte with *Meloidogyne incognita* var. *acrita* (root-knot nematode)." **44** (1), 43–49.
†c. TARJAN, A. C., 1954.—" Controlling root-knot infections of greenhouse tomatoes wit 3-p-chlorophenyl-5-methyl rhodanine." **44** (2), 112.
†d. TARJAN, A. C. & HOPPER, B. E., 1954.—" Suitability of *Panagrellus redivivus* as a te organism for contact nematicide evaluation." **44** (2), 112.

(42a) A rapid green-house test has been developed by means of which 380 varietie and strains of lima bean, *Phaseolus lunatus*, have been tested for resistance to root-kno *Meloidogyne incognita* var. *acrita*. The seed is sown in beds of infested sandy soil kept at

† Abstract of paper presented at the 9th Annual Meeting of the Northeastern Division of the America Phytopathological Society, West Springfield, Mass., November 5–6, 1953.

temperature of 20°C. to 24°C., and the degree of galling of the roots is assessed after the plants have grown for about 60 days. A wide range of variation in resistance was found and 12 strains which proved highly resistant in green-house trials and immune in a few field trials have been selected for further breeding work. M.T.F.

(42b) By means of single-larva inoculations on Allgold sweet potatoes three lines of *M. incognita* var. *acrita* have been kept going for 14, 14 and 7 generations respectively. Comparison of the infectivity of larvae of this species to Marglobe tomato and to Improved Long Green cucumber have shown that both with single-larva and 25-larvae inoculations more larvae enter cucumber than tomato roots. It is suggested that this difference represents a genetic difference between the two hosts. Measurements of gall size in relation to the number of larvae within showed a high positive correlation but it is pointed out that gall size depends also on the species of plant and of nematode. Local root swellings without larvae inside were observed in tomato but they were smaller than single-larva galls. Gall-formation is considered to be the result of a different process from that of giant-cell formation since the giant cells are present in the absence of galls in plants parasitized by *Heterodera schachtii*. M.T.F.

(42c) Owing to its versatility in controlling root-knot infections, 3-*p*-chlorophenyl-5-methyl rhodanine was used in more extensive green-house tests with tomato plants, the roots of which were infected with *Meloidogyne incognita*. Complete control was obtained by applying the chemical in emulsion form at the rates of 4 gm. and 2 gm. per sq. ft. Non-infected seedlings transplanted into soil in which the dry chemical had been mixed at the rate of 2 gm., 1 gm. or 0·5 gm. per sq. ft. of surface area and inoculated with five nematode egg masses, also showed complete control. R.T.L.

(42d) *Panagrellus redivivus*, having been compared with seven other nematodes, was selected as a preferred organism for testing nematicidal values because of its large size, easy culture, short life-cycle and active habit. R.T.L.

43—Proceedings of the Alumni Association, Malaya.

a. HOEPPLI, R., 1954.—" Some early views on parasites and parasitic infections shared by the people of Borneo, Malaya and China." **7** (1), 3–17.

44—Proceedings of the Royal Society of Medicine.

a. CRAWFORD, M., 1954.—" The epidemiology and causation of recurrent iridocyclitis of horses." **47** (4), 233–236. [Discussion pp. 236–239.]

(44a) Opening the discussion on periodic ophthalmia in horses Crawford reviewed the epidemiology and possible causes of the disease. He considers that nematode larvae, especially those of the genera *Setaria* and *Onchocerca*, may be the cause either by acting directly or as allergens. In the discussion Crowhurst disagreed that nematodes were a likely cause, Ashton gave a detailed account of the pathology and McCunn considered vitamin deficiency to play a large part. S.W.

45—Proceedings of the Society for Experimental Biology and Medicine.

a. DAUGHERTY, J. W., 1954.—" Synthesis of amino nitrogen from ammonia in *Hymenolepis diminuta*." **85** (2), 288–291.

(45a) *Hymenolepis diminuta* is capable of synthesizing amino nitrogen in the presence of α-ketoglutaric acid, pyruvic acid or oxalacetic acid and ammonium ions. Glucose is also capable of serving as a substrate for the synthesis of amino nitrogen from ammonium nitrogen through its degradation to intermediary keto acids. The yield does not approach that of the more direct system. It is also shown that the tricarboxylic cycle functions actively in the living intact worm. R.T.L.

46—Proceedings of the Zoological Society of London.

a. FANTHAM, H. B. & PORTER, A., 1954.—" The endoparasites of some North America snakes and their effects on the Ophidia." **123** (4), 867–898.

(46a) Fantham & Porter record a number of helminths from North American snake *Microfilaria pituophis* n.sp. is described and figured from *Pituophis melanoleucus* but the adu could not be found. Notes are given on the pathological findings and possible methods c treatment. S.W

47—Revista Cubana de Laboratorio Clínico.

a. BASNUEVO, J. G. & FONTAO, J. A., 1954.—" Ascariasis y dietilendiamina (piperacina). 8 (1), 19–21.
b. CAUSA, A., MILANÉS, F. & LEÓN, P. M., 1954.—" Alteraciones histo-patológicas d hígado en algunas parasitosis. Estudio clínico-patológico." 8 (1), 22–29.

(47a) Seven out of ten children with ascariasis were cured with diethylenediamin hydrate (piperazine) at the rate of 0·3 gm. per year of age daily for ten days. P.M.E

(47b) This account, illustrated with photomicrographs, of various histo-pathologica changes in the human liver includes brief notes on the finding at autopsies in Habana, Cub of (i) a *Cysticercus cellulosae* in a calcified nodule in an otherwise normal liver and (ii) a capsul of connective tissue containing a *Fasciola hepatica* in the interior of the liver parenchyma The histo-pathological study of a number of human cases of fascioliasis by puncture biops is briefly described. P.M.E

48—Rhodesian Tobacco.

a. MARTIN, G. C., 1954.—" Nematoses." Year 1954, No. 4, pp. 28–29.

(48a) In this general outline of his proposed investigations of nematode diseases of plant in Rhodesia, with particular reference to root-knot nematodes in tobacco, Martin mention that both *Meloidogyne javanica* and *M. hapla* have been found there, the former on 16, th latter on 10 plant species which are not named. He claims that a hitherto undescribed stag in the life-history of these nematodes has been discovered in Rhodesia [but does not say wha this is]. M.T.F

49—Science. Lancaster, Pa.

a. BAKER, A. D., BROWN, G. L. & JAMES, A. B., 1954.—" Relationships of fungi, mites, an the potato-rot nematode." **119** (3081), 92–93.
b. GERRITSEN, T., HEINZ, H. J. & STAFFORD, G. H., 1954.—" Estimation of blood los in hookworm infestation with Fe^{59}: preliminary report." **119** (3091), 412–413.

(49a) Intimate relations between plant-parasitic nematodes and fungi may be mor important than has hitherto been suspected. In potato tubers infested by *Ditylenchus destructor* large populations of the nematode occur in those areas which have broken down. The nema todes apparently feed on the abundant fungal growths. In adjoining healthy tissue th number of worms is low. When fungus plates are inoculated with *D. destructor*, the worm tend to congregate around the fungus colonies and feed on the mycelium. Live potato tissue i not essential for their propagation. R.T.L

(49b) Hahn & Offutt's method of using radioactive iron to study the blood loss i hookworm infection in dogs [for abstract see Helm. Abs., **18**, No. 490a] was applied to thre Angola Africans who were healthy carriers of hookworm with comparatively low haemoglobi values. There was a daily loss of 10 ml. to 20 ml., i.e. 5 mg. to 10 mg. of iron, which cor responded with the observed haemoglobin values. In one patient with a low worm burde there was a high blood loss which could only be explained on the assumption that the worm had caused one or two profusely bleeding injuries. R.T.L

)—Scottish Agriculture.

a. ANON., 1954.—" Notes from Auchincruive—VII." **33** (4), 216–219.

(50a) It is concluded from a series of experiments in Ayrshire that D-D mixture has a ree-fold action when applied to fields infected with *Heterodera rostochiensis*. It can lower the umber of larvae in cysts and the number of eggs in the cysts presumably by causing them to itch and it can stimulate potato growth directly. The cost of applying 200 lb. of D-D or hylene dibromide is £15 per acre and that of the labour involved is £3 per acre. With early otatoes this gives an average yield of 1·4 tons of potatoes per acre over a period of two or ree years. When the dose is doubled the value of the increased produce is still about twice e cost. A scheme of dual treatment with D-D on main crop potatoes grown on a seven-year tation is suggested. The first application follows the first potato crop; this is succeeded by ts for one year then ley for four years. D-D is again applied and oats sown to be followed the second potato crop. That a moderate initial infestation may persist for twenty years d still be capable of producing disease is confirmed. R.T.L.

—Transactions of the American Microscopical Society.

a. HUGGHINS, E. J., 1954.—" Life history of a strigeid trematode, *Hysteromorpha triloba* (Rudolphi, 1819) Lutz, 1931. I. Egg and miracidium." **73** (1), 1–15.
b. WOODHEAD, A. E., 1954.—" Bisexual reproduction in the mother sporocyst of *Paragonimus kellicotti* (Trematoda)." **73** (1), 16–28.
c. CHAPMAN, J. A. & HUNTER, III, G. W., 1954.—" Studies on host-parasite reactions. VII. The pigment cells surrounding the metacercarial cysts of *Cryptocotyle lingua* in the cunner, *Tautogolabrus adspersus* (Walbaum)." **73** (1), 28–36.
d. SPARKS, A. K., 1954.—" A new species of *Multitestis* (Trematoda, Allocreadiidae) from the sheepshead (*Archosargus probatocephalus*) in the Gulf of Mexico." **73** (1), 36–38.
e. WONG, L. W. & WAGNER, E. D., 1954.—" A rapid method of sexing snails, *Oncomelania nosophora*." **73** (1), 66–67.

(51a) An account is given of the development of the miracidium of *Hysteromorpha loba* during the seven days preceding hatching; its structure, body form and dimensions, iated epidermal cells, cilia, sense organs and nervous system, apical gland, germ cells, cretory system and parenchymal cells are described in great detail. Refrigeration at 8°C. two weeks did not affect the viability of the unembryonated eggs. R.T.L.

(51b) Woodhead's observations were based on a study of the slides prepared by Chen her paper (1937) on the germ cell cycle in *Paragonimus kellicotti*. The miracidium when tched contains male germ cells in the early spermatid stage. The primary, secondary and tiary spermatogonia, primary spermatocytes, oögonium and oöcyte are described. The w facts tend to support the theory of an expanded metamorphosis showing three successive nerations of which the first and second develop in the mollusc and the third in the vertebrate st. The first generation represents the form that became a parasite when the Mollusca t appeared in geological time. Some eggs then began to hatch within the mollusc and in ne the larvae of the second generation migrated into a new chemical environment within the llusc and became adult. The eggs of the first generation ceased to be shed outside. A second iod of time elapsed and eggs produced by the second generation were shed into the water d on hatching entered a suitable mollusc. With the appearance of the vertebrates, some of second generation larvae remained in the mollusc and on leaving entered a vertebrate. ly those in chemical harmony in the vertebrate host survived to develop into adults and lay gs. R.T.L.

(51c) Observations were made on the chromatophores which surround metacercarial ts as a result of both natural and artificial infection of the cunner fish, *Tautogolabrus adspersus*, the actual mechanism of such pigment formation remains unexplained. R.T.L.

(51d) *Multitestis rotundus* n.sp. from *Archosargus probatocephalus* caught in the Gulf Mexico is characterized by its oval shape, the presence of body spines extending to the end he gut branches, the distribution of the vitellaria over the entire body, and by the number d position of the testes of which there are six on the left and five on the right. R.T.L.

(51e) Wong & Wagner describe in detail their procedure for sex determination in th dioecious snail *Oncomelania nosophora*. A Zeiss-Opton stereoscopic microscope supported o an Erb & Gray illuminator to provide both transmitted light and an overhead beam of light t be directed on to the snails are used. The intensities of the lights are regulated by rheostat so that the transmitted light can be reduced to a minimum brightness and the overhead bean to a maximum illumination. The snail to be sexed is held by a whorl using straight forcep and is gently placed on its back or side with the overhead beam directed into the apertur while the snail is submerged in water in a petri dish. The illumination of the aperture in th submerged snail stimulates it to extend its foot to right itself. The presence of the penis i the male is readily detected behind the head when the body is extended. Snails of approximatel one month old can be readily sexed. P.L.le

52—Transactions of the Royal Society of Tropical Medicine and Hygiene.

a. LEROUX, P. L., 1954.—" Hybridization of *Schistosoma mansoni* and *S. rodhaini*." [Demor stration.] **48** (1), 3–4.
b. LEROUX, P. L., 1954.—" The phenomenon of aggregation exhibited by cercariae of (a) paramphistomid and (b) two echinostomids." [Demonstration.] **48** (1), 4.
c. LEROUX, P. L., 1954.—" Experimental schistosomiasis haematobia in the white mouse [Demonstration.] **48** (1), 4.
d. LEROUX, P. L., 1954.—" Experimental schistosomiasis haematobia in the golden hamster [Demonstration.] **48** (1), 4.
e. LEROUX, P. L., 1954.—" A new molluscan host (*Bulinus coulboisi*) for *Schistosoma haematobiu* in Central Africa." [Demonstration.] **48** (1), 4.
f. LEROUX, P. L., 1954.—" The infection of laboratory-bred specimens of *Bulinus* (*Pyrgophys forskalii* from Gambia with an Egyptian strain of *Schistosoma haematobium*." [Demonstration **48** (1), 5.
g. LEROUX, P. L., 1954.—" Hitherto unrecorded cuticular structures on adult *Schistosoma* spp [Demonstration.] **48** (1), 5.
h. LEROUX, P. L., 1954.—" Geographical distribution of the European and African mammali *Schistosoma* spp. and of their intermediaries." [Demonstration.] **48** (1), 5.
i. BERTRAM, D. S., 1954.—" Further results in superinfection of cotton-rats with *Litomosoic carinii*." [Demonstration.] **48** (1), 6.
j. KERSHAW, W. E., DUKE, B. O. L. & BUDDEN, F. H., 1954.—" The distribution of t microfilariae of *Onchocerca volvulus* in the skin of man and its relation to the skin lesions and blindness." [Demonstration.] **48** (1), 7–8.
k. DUNN, D. R., 1954.—" (1) The incidence of lungworms in pigs in north-west Britain. Some observations on the establishment of *Metastrongylus apri* in laboratory animals [Demonstration.] **48** (1), 9–10.
l. HAWKING, F. & McFADZEAN, J. A., 1954.—" Factors influencing the periodicity microfilariae." [Demonstration.] **48** (1), 10–11.
m. McFADZEAN, J. A., 1954.—" *Wuchereria bancrofti* and elephantiasis in West Africa." [Demo startion.] **48** (1), 11.
n. BROWNE, S. G., 1954.—" Sections of skin taken from cases of onchocerciasis in the Belgi Congo, showing various stages of pinta-like depigmentation." [Demonstration.] **48** (1), 15
o. GHANEM, M. H., 1954.—" The treatment of ascariasis and ancylostomiasis with hetraz (diethylcarbamazine)." **48** (1), 73–76.
p. ALVES, W. D., GELFAND, M. & WEINBERG, R., 1954.—" A case of sparganosis in African from Portuguese East Africa." **48** (1), 87–88.
q. SCHWETZ, J., 1954.—" On two schistosomes of wild rodents of the Belgian Congo: *Schis soma rodhaini* Brumpt, 1931; and *Schistosoma mansoni* var. *rodentorum* Schwetz, 1953; a their relationship to *S. mansoni* of man." **48** (1), 89–100.
r. BLAIR, D. M. & ALVES, W., 1954.—" Control of malaria and bilharziasis." [Correspondenc **48** (1), 101.
s. COWPER, S. G., 1954.—" On African schistosomiasis." [Correspondence.] **48** (2), 185–18
t. SCHWARZ, E., 1954.—" On African schistosomiasis." [Correspondence.] **48** (2), 186–18

(52a) leRoux has produced hybrids of *Schistosoma mansoni* and *S. rodhaini* in mice using cercariae from snails infected by miracidia obtained by infecting mice with a mixtu of male cercariae of *S. rodhaini* and female cercariae of *S. mansoni*. Hybrids were also obtain with miracidia resulting from fertilization of *S. rodhaini* females by *S. mansoni* males. T shape of the eggs of the hybrids closely resembles the eggs of *S. mansoni* var. *rodentoru* Miracidia from these hybrids readily infected *Bulinus alexandrina* although attempts to infe

the species with *S. rodhaini* failed repeatedly. *B. pfeifferi* from Kenya and Albertville in the Belgian Congo which proved rather resistant to *S. rodhaini* were also readily infected. leRoux suggests that the commonly accepted *S. mansoni* may really be a hybrid of that species with other closely related forms, that the eggs of the *bovis* and *mattheei* types recovered from man may have arisen from interbreeding of mammalian schistosomes of the terminal spined group and that the *S. haematobium* recently recorded in India may be a hybrid which has inherited infectivity for an Indian mollusc from its Indian parent. R.T.L.

(52g) leRoux has observed that in adult male and female schistosomes there are short hair-like structures especially on the anterior end. They are probably tactile organs, each hair projecting from a minute mound on the surface of the cuticle. R.T.L.

(52j) Examination of multiple skin snips from about 100 persons with *Onchocerca volvulus* showed that the numerical distribution of the microfilariae had a clear pattern which was related to the skin lesions and to blindness in early or light infections. There were microfilariae in the same anatomical area as the nodule. In cases of moderate intensity, the microfilariae are usually few or absent in the shoulders, arms and face and are most common in the ankles, calves and buttocks and less so in the thighs and waist. Their distribution appears to be independent of the exact position of the nodules. The concentration is proportional to the degree of lichenification. As the cases become more advanced the microfilarial concentration falls. The same general pattern occurs in cases of blindness but where there are eye lesions the shoulders and face give microfilariae. R.T.L.

(52k) Of 890 pigs from North Wales, Cheshire, Lancashire and parts of Ireland, received at a bacon factory, the number infected with *Metastrongylus* spp. averaged 15·7%. They came from 169 farms and 38·1% of these sent infected pigs. Dunn also describes his technique for maintaining and infecting earthworms in the laboratory and his experimental work on *Metastrongylus apri* in guinea-pigs. R.T.L.

(52l) Nocturnal periodicity occurs in East African monkeys infected with a new species of filaria to be called *Dirofilaria aethiops* [nomen nudum]. The lungs proved to be the chief reservoir of the microfilariae by day. It is not yet possible to identify the stimuli which promote the diurnal accumulation in the lungs and their liberation at night. R.T.L.

(52m) The incidence of elephantiasis in four West African villages was not directly related to that of microfilaraemia in the population or to the microfilarial density per infected person. R.T.L.

(52 o) Hetrazan was used with good results in 125 patients with ascariasis but gave poor results in 36 patients with ancylostomiasis. It was given with safety in cases of pregnancy, severe anaemia, renal, hepatic, thoracic and cardiac diseases. Its efficacy is the same as that of hexylresorcinol but it may be preferable as it can be given to children in a palatable syrup, has a low toxicity and can be used for mass treatment. Its cost is the main drawback. R.T.L.

(52p) An enormous number of small, hard, mobile and slippery nodules were present beneath the skin in a native of Portuguese East Africa. They occurred chiefly on the anterior abdominal wall, upper parts of the thighs and lower part of the thorax and contained spargana. X-ray showed numerous scattered oval shadows of varying size scattered throughout the abdomen, pelvis and thighs. R.T.L.

(52q) Schwetz summarizes his earlier papers on schistosomes of wild rodents in the Belgian Congo. The eggs of *Schistosoma rodhaini* always have a subterminal spine but there are many smaller morphological variations. Natural infections were found in *Planorbis pfeifferi* at Elisabethville and Sakania and in *P. tanganikanus* at Albertville, but in the laboratory many other *Planorbis*, including *P. boissyi* and *P. glabratus*, can transmit *S. rodhaini*. In Sakania there is a natural mixed focus of infection with *S. rodhaini* and *S. mansoni*. Associated with the eggs of *S. rodhaini* in Sakania and alone in Albertville, Schwetz also found in 4% of wild

rodents a light and inconspicuous infection of eggs with a lateral spine. These differed, however, from the normal eggs of *S. mansoni* in that they were elongated with a narrow extremity. The spine was solid with a wide insertion and separated from the rest of the egg by a notch. It is now named *S. mansoni* var. *rodentorum*. It may be that it is the same species as *S. mansoni* in man which has become modified and adapted to different hosts. R.T.L.

(52r) In the table accompanying Blair & Alves' paper on the control of malaria and bilharziasis [for abstract see Helm. Abs., **22**, No. 148p], a figure of seven tons of benzene hexachloride at a cost of £1,400 is shown as the average annual consumption by each unit. It should have been 3½ tons at a cost of £700. R.T.L.

(52s) Cowper questions the wisdom of the changes in the taxonomy of molluscan vectors suggested by Amberson & Schwarz [for abstract see Helm. Abs., **22**, No. 413a]. He also points out that *Bulinus truncatus* and *B. forskali* have not yet been recorded for Madagascar and that neither *Bulinus* nor *Pyrgophysa* have been found in the Seychelles, Réunion or Rodriguez. The importance of birds in the spread of molluscs is also questionable. On the subject of molluscicides he states that even if their harmful effect on the fish supply can be proved there are areas like Mauritius where the population consume marine fish almost exclusively. R.T.L.

(52t) In reply to Cowper [see No. 52s above] Schwarz states that he accepts full responsibility for his taxonomic revision of the African vectors of schistosomiasis. He prefers to regard the four major groups of *Bulinus* as species rather than genera. Schwarz has seen specimens of *Bulinus* from Mauritius, Réunion and Seychelles which Clessin has described as *B. seychellensis*. The occurrence of the European *Limnaea truncatula* along the Central African flyway can only be explained by their conveyance by birds. Copper sulphate and other molluscicides have only a temporary effect in reducing fish populations and cannot be applied in many areas in Africa where schistosomiasis is rampant. The sad fact that tartar emetic is still the most successful drug for schistosomiasis emphasizes the need for the development of an entirely new line of chemical approach. R.T.L.

53—Veterinarski Arhiv.

a. VRAŽIĆ, O. & RICHTER, S., 1954.—"Prilog entoparasitskoj fauni naše domaće guske." **24** (1/2), 15–17. [English & German summaries p. 17.]

(53a) Examination post mortem of 18 healthy native geese and eight goose heads revealed great numbers of *Paramonostomum alveatum* in the large intestine of two birds and an unidentified species of *Hyptiasmus* in the suborbital sinuses of ten birds. In one bird a single specimen of *Prosthogonimus cuneatus* was found in the bursa Fabricii; this species is not yet established in geese in Yugoslavia. R.T.L.

54—Veterinary Medicine.

a. WHITNEY, L. F. & WHITNEY, G. D., 1954.—"The removal of whipworms by n-butyl chloride." **49** (2), 78, 88.
b. HERLICH, H. & PORTER, D. A., 1954.—"Control of internal parasites of cattle by free-choice administration of phenothiazine." **49** (3), 103–106.
c. NEWBERNE, J. W. & BAILEY, W. S., 1954.—"A preliminary study on the effectiveness of hexylresorcinol suspension as an enema in removing hookworms, and whipworms from dogs." **49** (3), 117–119, 122.
d. BEAVER, P. C., 1954.—"Parasitic diseases of animals and their relation to public health." **49** (5), 199–202, 205.

(54a) When dogs have whipworms in addition to hookworms or roundworms, as revealed by faecal examination, it is recommended that five times the ordinary dose of *n*-butyl chloride based on body-weight be split into four doses and one be given at hourly intervals without a purge. This procedure eliminates almost 100% of the whipworms as well as the hookworms and roundworms. R.T.L.

(54b) Details are given of an experiment extending over two years in which 28 calves, four to nine months old, were given phenothiazine-mineral mixture by free choice and were kept on a pasture continuously grazed. The results indicated that the level of parasitic infection with *Haemonchus contortus* and *Oesophagostomum radiatum* was effectively controlled. There was no significant difference in the average weights of the experimental animals and the controls, due probably to the fact that low level parasitism produces no clinical effects. R.T.L.

(54c) Enemata containing 0·2%, 0·4% and 0·5% hexylresorcinol suspensions were variable in efficacy in removing hookworms, roundworms and whipworms from dogs. Owing to its low toxicity, the use of hexylresorcinol as an enema is considered to be justified for debilitated, heavily infected puppies and for dogs primarily ill from other causes. R.T.L.

(54d) In considering the parasites of animals in relation to public health, Beaver points out that the most important type of accident that may happen to the infective stages of parasites is to get into an unnatural host. As examples he cites trichinelliasis, hydatid, cysticerciasis, Dipylidium and Hymenolepis infections, and larva migrans due to the larvae of *Ancylostoma braziliense*, *A. caninum*, *Uncinaria stenocephala* and *Bunostomum phlebotomum*. Attention is drawn to the recent discovery, mostly in children under three years old, of visceral larva migrans due to the larvae of *Toxocara canis* and *T. cati*, and to the possibility of the occurrence of setariasis in man. R.T.L.

55—Veterinary Record.

a. FARRELLY, B. T., 1954.—" The pathogenesis and significance of parasitic endarteritis and thrombosis in the ascending aorta of the horse." **66** (4), 53–61.
b. POYNTER, D., 1954.—"Seasonal fluctuation in the number of strongyle eggs passed by horses." **66** (5), 74–78.
c. POYNTER, D., 1954.—" Observations on the relative increase of *Strongylus* species following the administration of phenothiazine to horses." **66** (7), 101–105.
d. URQUHART, G. M., JARRETT, W. F. H. & O'SULLIVAN, J. G., 1954.—" Canine tracheobronchitis due to infection with *Filaroides osleri*." **66** (10), 143–145.
e. OLDHAM, J. N., 1954.—" Infection with *Filaroides osleri*." [Correspondence.] **66** (12), 181.
f. FORSYTH, H., 1954.—" Infection with *Filaroides osleri*." [Correspondence.] **66** (12), 181.
g. FOSTER, A. O., 1954.—" Helminthiasis in elephants." [Correspondence.] **66** (13), 196.

(55a) Farrelly records lesions of parasitic arteritis in the horse as far forward as the bulbus aortae and the aortic sinuses, and describes the clinical and patho-anatomical features seen in four cases. He suggests that during their migration *Strongylus vulgaris* fourth-stage larvae do not always leave the circulation in the lungs. They may continue into the left heart and thus gain the aorta, descend into the cranial mesenteric artery, penetrate the medial and lateral caecal arteries and their terminal branches in the caecal wall. They then penetrate this to reach the lumen of the caecum. Should any larva be delayed, it proceeds to its late fourth and fifth stages of development, irrespective of its environment, behaving as if it had already reached the caecum and attaches itself to the vessel wall giving rise to the characteristic lesions of endarteritis. R.T.L.

(55b) Poynter is of opinion that the seasonal rise in the number of ova of *Trichonema* and *Strongylus* passed by horses is stimulated by new parasites reaching maturity in the alimentary canal because a rise still occurs after the parasite population is reduced by phenothiazine. R.T.L.

(55c) Poynter submits data confirming Gibson's conclusions [for abstract see Helm. Abs., **22**, No. 107d] that the percentage of *Strongylus* sp. as determined by differential larval counts tends to rise after the administration of phenothiazine to horses but that the effect is transitory, the majority of the larvae eventually found being again those of the small strongylids. R.T.L.

(55d) An outbreak of tracheo-bronchitis due to *Filaroides osleri* is reported in greyhound in Annan, Scotland. A brief account of the clinical history is followed by an illustrated description of the macroscopical and microscopical lesions and of the morphology of the parasites. An aqueous suspension containing about 300 larvae was administered to a six-week old puppy. No lesions were observed at autopsy 60 days later but in sections of the lung an immature female nematode was seen in transverse section. The authors conclude that this nematode was neither an Ascaris nor a hookworm but was possibly a *Filaroides osleri*. R.T.L

(55e) Several hundred ten-day-old larvae of *Filaroides osleri* were fed to a dog but at autopsy four months later there was no evidence of infection. Oldham quotes Dougherty's opinion that *Filaroides* is related to *Metathelazia* and *Aelurostrongylus* which employ terrestrial gastropods as intermediate hosts. R.T.L

(55f) Several cases of canine tracheo-bronchitis due to *Filaroides osleri* occur annually in Gloucestershire. An intramuscular injection of 1 c.c. to 2 c.c. of anthiomaline given on three occasions, each at three day intervals, caused severe depression. Oral dosing with banocide did not give consistently good results. R.T.L

(55g) Foster reports that several timber-hauling elephants which he had examined post-mortem in Sarawak were found to be heavily infected with *Bathmostomum sangeri*. R.T.L

56—West African Medical Journal.

a. COLBOURNE, M. J., 1954.—" The treatment of onchocerciasis with small doses of antrypol." **3** (1), 46–47.
b. GAMBLE, M. E., 1954.—" Vesical carcinoma associated with widespread schistosomiasis." **3** (1), 48–51.

(56a) Two hundred schoolchildren in Gambaga and Nalerigu, in the northern part of the Gold Coast, were examined by intradermal skin smears and 34 were found to have *Onchocerca volvulus* infection. These positive cases were given intramuscularly 20 mg. of antrypol per kg. body-weight and half of them received a second dose one week later. Observation was maintained on 24 of the cases for 15 months and 12 were then negative. There was no difference between those who had received a single dose and those who had been given two. It is concluded that these doses produced less satisfactory results than those used by Sarkies [for abstracts see Helm. Abs., **21**, Nos. 68a, 152m] who gave 170 mg. per kg. body-weight spread over eight weeks. R.T.I

(56b) At autopsy a case of vesical carcinoma in a native of the Gold Coast showed eggs of *Schistosoma haematobium* in the lungs, kidney and bladder. There were schistosome tubercles in the liver. There was very little renal tissue. The kidneys were cystic and filled with pus and the ureters were grossly dilated and hypertrophied. The bladder wall was greatly thickened and infiltrated with a fungating squamous cell carcinoma and many schistosome eggs. There were numerous small malignant nodules in the mesentery and in the peritoneal coat of the intestines; secondary deposits were present in the lungs and liver. R.T.I

57—Zeitschrift für Parasitenkunde.

a. GERMANS, W., 1954.—" Laboratoriumsuntersuchungen über die Resistenz der Eier des menschlichen Spulwurmes *Ascaris lumbricoides* L." **16** (2), 93–110.
b. ENSTE, L., 1954.—" Beiträge zur Kenntnis der Filairie *Icosiella neglecta* Diesing 1851 in Blut und Gewebe von *Rana esculenta* L." **16** (2), 126–144.

(57a) Germans' paper, which is a summary of his inaugural dissertation at Marburg University, gives the results of his laboratory experiments on the resistance of *Ascaris lumbricoides* ova to physical, chemical and biological influences. He confirms that ova are particularly

resistant to physical factors, the only exceptions being high temperatures (embryonated ova were killed within two hours at 45°C. and within half an hour at 50°C.) and lack of moisture (ova were affected if the water content of soil was less than 6%). Germans tabulates the results obtained by earlier workers with chemicals; the figures show that only phenol and carbon disulphide kill Ascaris ova quickly, but both substances are too toxic to plant life to be used for control purposes. The author's own experiments show that neither proteolytic enzymes, santonin, ascaridole nor chenopodium oil have any effect on Ascaris ova. From experiments with lettuce plants Germans concludes that ova can be removed from green vegetables by placing them in a suitable wetting agent and then shaking the plants thoroughly or rinsing them in running water. A.E.F.

(57b) Enste collected a total of 600 *Rana esculenta* from 13 different points within the district of Giessen. Specimens from each point were found to be infected with microfilariae of *Icosiella neglecta*, the infection rate at the individual points varying between 7% and 35%. (A number of frogs collected at Münster were all negative.) Neither *Forcipomyia velox* nor *Sycorax silacea*, the insect vectors previously implicated in the transmission of *I. neglecta*, could be found in the Giessen area. Infected frogs showed no external signs of parasitization, neither could any pathological effect be established. The finding of adult worms principally in the subcutaneous and intramuscular connective tissue of the frogs confirmed earlier work on this parasite. Enste could find no evidence of microfilarial periodicity. Neither temperature nor light affected the density of microfilariae in the blood. A.E.F.

58—Zoologische Jahrbücher. Abteilung für Systematik, Ökologie und Geographie der Tiere.

a. KÖRNER, H., 1954.—" Die Nematodenfauna des vergehenden Holzes und ihre Beziehungen zu den Insekten." 82 (3/4), 245–353.

(58a) The nematode fauna found in the rotting wood of dead tree stumps, to the number of 104 species, are classified by Körner into four oecological and biological groups, viz., (i) 40 species which are specific to decayed wood, (ii) 15 species which may occur in this medium, (iii) 30 species of soil nematodes and (iv) 19 extraneous species (e.g. from rotting potatoes, manure or carrion). Xylophagous insects are of great importance to these nematodes: the frass of their larvae provides sustenance and the imagines provide transport. The nematode incidence in the beetles differed greatly: it was 89·9% in Lucanidae as compared with 6·2% in Cerambycidae. Whereas the soil nematodes invade both deciduous trees and conifers, many of those specific to rotting wood are limited to either one type of tree or the other. Among the 104 species listed, the following 31 new forms are figured: *Rhabditis* (*Protorhabditis*) *postneri* n.sp., *R.* (*P.*) *rühmi* n.sp., *R.* (*P.*) *xylocola* n.sp., *R.* (*P.*) *virgo* n.sp., *R.* (*P.*) *parvovelata* n.sp., *R.* (*Mesorhabditis*) *tenuispicula* n.sp., *R.* (*M.*) *oschei* n.sp., *R.* (*M.*) *irregularis* n.sp., *R.* (*M.*) *ultima* n.sp., *R.* (*Caenorhabditis*) *rara* n.sp., *R.* (*C.*) *pseudodolichura* n.sp., *R.* (*Rhabditis*) *serrata* n.sp., *R.* (*Choriorhabditis*) *insectivora* n.sp., *Rhabditonema propinquum* n.g., n.sp., *Panagrolaimus spondyli* n.sp., *Micronema minutum* n.g., n.sp., *M. parvum* n.sp., *Tricephalobus lignicolus* n.sp., *Diplogaster* (*Diplogaster*) *incurvus* n.sp., *D.* (*Eudiplogaster*) *splendidus* n.sp., *D.* (*E.*) *ucani* n.sp., *D.* (*E.*) *sinodendroni* n.sp., *D.* (*E.*) *goffarti* n.sp., *D.* (*E.*) *systenoceri* n.sp., *D.* (*E.*) *uziae* n.sp., *Diplogasteroides* (*Diplogasteroides*) *crassus* n.sp., *Neodiplogaster velatus* n.sp., *N. wacheki* n.sp., *Pseudodiplogasteroides compositus* n.g., n.sp. (for which a new subfamily Pseudodiplogasteroidinae is created), *Aphelenchoides stammeri* n.sp. and *A. lignophilus* n.sp. *Rhabditis insectivora* reaches sexual maturity in the dwarf stag-beetle *Dorcus parallelopipedus*. Körner proposes the amalgamation of Panagrolaiminae Thorne, 1937 and Turbatricinae Goodey, 1943. *Pseudodiplogasteroides compositus* has a muscular oesophageal bulb bearing a flap apparatus. This new genus appears to close the gap between the Rhabditidae and the Diplogasteridae. R.T.L.

NON-PERIODICAL LITERATURE

59—OPINIONS AND DECLARATIONS RENDERED BY THE INTERNATIONAL COMMISSION ON ZOOLOGICAL NOMENCLATURE.

a. INTERNATIONAL COMMISSION ON ZOOLOGICAL NOMENCLATURE, 1954.—"Opinion 201. Validation, under the Plenary Powers, of the generic name *Necator* Stiles, 1903 (Class Nematoda) (correction of an error in Opinion 66)." **3** (20), 267–274.

b. INTERNATIONAL COMMISSION ON ZOOLOGICAL NOMENCLATURE, 1954.—"Opinion 226. Suppression, under the Plenary Powers, of the generic name *Bilharzia* Meckel von Hemsbach, 1856, for the purpose of validating the generic name *Schistosoma* Weinland, 1858 (Class Trematoda) (Opinion supplementary to Opinion 77)." **4** (16), 177–200.

c. INTERNATIONAL COMMISSION ON ZOOLOGICAL NOMENCLATURE, 1954.—"Opinion 227. Acceptance of the lectotype selected by Braun in 1901 for the nominal species *Fasciola ovata* Rudolphi, 1803 (Class Trematoda)." **4** (17), 201–208.

(59a) The generic name *Necator* Stiles, 1903 was placed on the Official List of Generic Names in Zoology in 1915. It has since been found that this name was preoccupied by *Necator* Sclater & Saunders, 1896, an emendation of the avian genus *Nicator* Finsch & Hartlaub, 1870. The International Commission on Zoological Nomenclature has therefore used its plenary powers to suppress the generic name *Necator* Sclater & Saunders, 1896 (Aves), to validate the generic name *Necator* Stiles, 1903 and to confirm the entry of *Necator* Stiles, 1903 in the Official List. R.T.L.

(59b) Under its plenary powers the International Commission on Zoological Nomenclature has suppressed the generic name *Bilharzia* Meckel von Hemsbach, 1856. With its junior homonym *Bilharzia* Cobbold, 1859 it has now been placed on the Official Index of Rejected and Invalid Generic Names in Zoology. R.T.L.

(59c) Rudolphi's original material of *Fasciola ovata* was found by Braun to contain two taxonomically distinct species. Braun selected one of them as being the species described by Rudolphi. The validity of this step is now accepted by the International Commission on Zoological Nomenclature, and *ovata* (in the binominal combination *Fasciola ovata*) has been placed on the Official List of Specific Trivial Names in Zoology. R.T.L.